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AN EXPERIMENTAL APPROACH TO PSYCHIATRY.*

By W. HORSLEY GANTT, M.D.

Phipps Psychiatric Clinic, Johns Hopkins Hospital, Baltimore.

I have the honor to present for your consideration certain facts which we have obtained from an elementary type of research—experiments begun chiefly on the basis of the Pavlovian concepts in Leningrad during my four and one-half years' collaboration with Professor Pavlov (who now at the age of 86, I rejoice to say, is still active) and continued at the Phipps Psychiatric Clinic under the general direction of Adolf Meyer.

After a brief introduction to the methodology of the conditioned reflex teaching, I shall mention artificial disturbances of behavior obtained in our laboratory, Pavlov's basis for a division into types, the analogies and contrast with the Freudian and Meyerian explanations, and finally a word about the relativity of psychobiological facts.

I. METHODOLOGY.

The Pavlovian school thinks of the cortex as a group of analyzers, composed of the various receptors—which in turn consist of end-organs capable of responding to the different forms of energy that impinge upon them—plus the conductor with its central connections. The analyzers have the function of selecting, from the various series of stimuli falling upon them, one specific kind. They are limited in their pick-up to only a small proportion of the types of energy known in the universe.

The particular stimulus taken up by the end-organ is now synthesized in the cortex, *i. e.*, combined with another activity already existing within the organism and determined by its structure. Thus we have a conditional reflex, a reaction elaborated by the coincidence of the environment (experience) with that individual organism (biological structure).

* Annual address read before the New England Society of Psychiatry, Boston, April 26, 1935.

Now the animal reacts to a particular stimulus by a definite form of overt expression, either secretion of gland or movement of muscle. The strict behavioristic school thought that psychobiology was contained within the limits of these external outpourings and changes in spatial relations; whereas others have subscribed to a central rather than psychobiological existence, and we have recently shown in our laboratory that when neither of these overt expressions is possible the reaction within the central nervous system persists. This state in the central nervous system is what we call excitation.

The above reactions of adaptation to experience are modifiable, hence when the conditions which have evoked the reactions are changed, there may be no overt response on the part of the animal. This state, derived from excitation, has been termed inhibition, but as the word has so many connotations it should be replaced by a less malodorous one, for example, negative excitation, as proposed by H. G. Wolff.¹

The Pavlovian concept of the cortex is that of an organ, analyzing and synthesizing, making connections between changes in the environment on the basis of individual experience (conditional reflex) with biological structures on the basis of species or hereditary experience (unconditional reflexes). In this concept the nature of the executor reaction, it seems, is of little importance, for the connections are made in the central nervous system, and the effector organ may produce very different results, not necessarily because the central connections are dissimilar, but because of the executors. Owing to the varying structures of the external defense organs, what a vast difference there is between the reactions to an enemy of an electric eel, a serpent, and a tiger. Each performs like a puppet pulled by strings, depending upon what the string is attached to; one shocks, another injects poison, the other rips asunder, according to whether the executor is an electric battery, a sac of venom, or teeth and claws.

An organ or nervous center functions thus not only by virtue of the stimulations falling upon it, but also because of an inherent property to perform in a certain way, plus modifications by ex-

¹ Wolff, H. G., and Gantt, W. H.: Effect on the highest integrative functions. *Arch. Neur. and Psychiatry*, 33: 1030-1057, 1935.

perience. An isolated strip of heart muscle beats indefinitely, and various nerve centers begin to discharge automatically at a certain stage of their development. The rôle that each plays—center and periphery—can be seen more clearly when the normal connection is replaced by another as when nerves are sutured to the wrong end organ. There is thus a determinism according to structure of each tissue, organ and center. The biologists recognize this when they speak of genes; the behaviorists, emphasizing the modifications by experience in their reflexology; and we as psychiatrists have our constitutional types, psychopathic dispositions, morons and geniuses.

There is now a general familiarity with the conditioned reflex method, but I shall review briefly the classical Pavlov experiment. The environment is fixed as far as possible by keeping the individual in a sound proof camera of constant temperature, and a uniform internal milieu is striven for by regulating the conditions of living, the time of working, feeding, etc. We artificially change only one element of the external environment, by introducing a sound, light, or a tactile stimulus, each evoked mechanically without the interpolation of the experimenter. Simultaneously we create another excitation in the organism by stimulating an inborn activity, such as secretion of saliva to food or acid, muscular movement to defense from pain, or investigation (orientation) to a new object. Our change of environment becomes a signal or conditional stimulus for the reaction which under this set of circumstances is called a conditional reflex, elaborated, as it is, and dependent upon, a temporal coincidence.

The segmental nervous system is set, so to speak, for the zoological species, and varies very little from individual to individual within the genus. It is, therefore, almost unconditional, only slightly adaptable, not subject to the experience of the individual, though it may be to the experience of the species. We are now investigating in our laboratory what is the delimitation between the modifiable (conditional) and unconditional reflexes. The conditioned reflexes are modifiable and change with environment and experience. The mechanism of this change is, as I shall describe in the laboratory experiment, brought about by the process of internal inhibition.

The organism has elaborated, let us say, a connection between a certain form of external energy (light, sound, touch, smell) so that

this signal sets off, like the trigger of a gun, a predetermined reaction dependent upon the structure and experience of that individual. But when this signal is not followed by the stimulus which once it signalized, the signal may lose its potency as a substitute. In the effector organ nothing may happen, but this does not mean that nothing happens in the central nervous system. On the other hand, there is produced an active state in the cortex which we term internal or cortical inhibition. On this basis we have the higher cortical differentiations which mark the lower animals from the higher as well as the idiot from the genius.

In the laboratory we bring this about by failing to give food (in the case when this has been the unconditioned stimulus) after its signal. Gradually the secretory and the motor conditioned reflexes drop out, and the animal responds by a state of muscular and secretory inactivity, which may spread over into sleep. We have now in our laboratory an animal with a differentiation between a metronome of 60 (positive) and 140 (negative) beats; this dog has for the past five years fallen asleep regularly almost exactly 8 to 10 seconds after the beginning of the negative metronome, in spite of the fact that there may be an interval of many months between trials.

It is important to think of this process, whether we call it inhibition or negative excitation, as an active cortical one; for the phenomena based upon it disappear when the cortex is extirpated. Also we can restore the positive activity by the method of disinhibition, or providing a stimulus that will inhibit the inhibition.

II. EXPERIMENTAL "NEUROSES."

A rearrangement in the time relations of the signal and the natural stimulus for the inborn or unconditioned reflex, or secondly a juxtaposition in space of the signals for excitation and for inhibition, may result in a disturbed nervous system of the animal.

In certain dogs, when a difficult differentiation is attempted, when the conditioned stimuli are brought closer and closer together, the animal may break down completely. The following experiments, performed by R. B. Loucks in our laboratory, and similar to many previous ones in Pavlov's laboratory, illustrate this. Three dogs were used to differentiate between two tones; in the beginning

only one tone was given, and it was always accompanied by food. Then a new tone was introduced and food not given. At first the animal reacts to the new tone by the same food reflex as before, *i. e.*, by secretion and muscular movement. After a certain number of repetitions the movements drop out, and later the secretion to the second tone, and we have not only a process of excitation to T₁ but the process of inhibition to T₂. Then T₂ is brought little by little closer in pitch to T₁. All three animals differentiate, but as the approximation is continued a point is reached when none of the animals can differentiate. Two of them turn to the food box on both of the tones. As the tones approximate the same pitch the animals evince restlessness, panting, and occasional barking. One of them develops a new reaction—he no longer takes food at all, even on the positive stimulus, but he begins to manifest the defense reflex. Furthermore he shows a stereotypy, so that he reacts to all the conditioned stimuli in nearly the same way, whether they be positive or negative, and even to those that were not connected with the original differentiation, that is, to any stimulus that has been used, light, tactile, etc., or almost any that may be introduced now into the experimental environment.

He whines and barks throughout the whole experiment, bites at the apparatus, shifts about in the stand from one foot to the other, pants vigorously, looks toward the door, tries to get away. The reaction to the food or to its signals is a specific avoiding one exactly like that we have seen in dogs to a painful stimulus such as the electric shock. When the signal for food begins this animal turns away from the food box, looks toward the door, struggles in his harness, tries to escape. He refuses absolutely to take any food in the experimental room. Merely the dropping of the food before him evokes the same defense reflex.

The animal will not run into the camera and jump on the table as he did before, although the other two dogs continue to do this, but not so avidly as before the differentiation. The disturbed one has to be coaxed and often pulled in against his resistance.

The whole set-up and milieu of the experimental camera now has an effect. Although when first brought into the camera he eats if fed from the hand, as soon as the routine salivary disk is applied, he refuses food, turns away from it as from a painful stimulus. If he is taken out of the camera into the surrounding room,

he can be coaxed to eat, but if any of the experimental stimuli are started, though he is unhampered and free to run, he immediately drops the food from his mouth and begins whining. When the conditional stimulus stops he begins playing again.

It was thought that rest might cure this animal, so he was given first six months' and then two years' rest without experimentation, but with only slight amelioration of his condition. As soon as he is put into the experimental camera, the old behavior recurs—refusal of food, whining, general defense reaction. And all of this when two years had elapsed since the experiment with the conflict, the differentiation that was impossible.

Bromides have been found by Pavlov to have beneficial influence on certain types of dogs in such nervous disturbances, and recently Liddell has used cortin with some effect in sheep (though it had no effect on our dog).

It is to be noted that outside of the experimental camera his behavior was normal as far as could be seen from casual observation. He played with his master, reacted to other dogs as formerly and ate with the usual canine appetite.

Pavlov has found such animals in his laboratory that break down only under the conditions of the experiment and are normal in other respects, but as soon as the difficult situation is brought up they go to pieces. He considers them analogous to paranoids.

In normal dogs excitation and inhibition can be readily interchanged without disturbance to the animal, by extinction of the former and reinforcement of the latter. But in animals with a weak nervous system, or those made weak by castration,² such interchange is not possible; on the other hand, the more one tries to convert or modify certain previous reactions the more difficult it becomes. Let us say that an animal has a positive conditioned reflex to M120 and a negative one to M60 and that these stimuli are interchanged so that the one which was formerly accompanied by feeding is now inhibitory and vice versa. In a normal dog when one conditioned reflex is extinguished the others become automatically extinguished too, but in an animal with a weak nervous system in whom there has been an attempted conversion of two metronomes,

² The idea of castration was suggested to Pavlov by the statement of Bleuler that paranoia is often characterized by sex insufficiency.

the extinction of other conditioned reflexes does not extinguish the pathological reaction to the metronome except after a long period—twelve and a half minutes compared with two minutes for other stimuli. The metronome remains a sore spot for the dog and all measures to remedy the condition tend only to aggravate it. The animal is normal in all respects except when his sore spot is touched; he is like a paranoic, stable in his perverse system of thinking.

In a paranoid dog of this type one and a half grams of bromide per rectum one-half hour before the experiment renders him tractable, making the conversion from the positive into the negative metronome easy, but the next day when the bromide is omitted the animal relapses into his former pathological condition. Pavlov recommends small doses of bromide for dogs of the weak type, and large doses for those of the strong type. The basis for these two types will be given later.

We have also obtained minor and transitory grades of disturbances in our normal animals which appear before they have mastered a differentiation between signals and vanish later. A "compulsion" or obsessive-like act was seen in two of our dogs when an excitatory stimulus was being converted into an inhibitory one, before adaptation was accomplished: the animal began to open the food box suddenly and impulsively between stimuli and without any signal, which it had never done before except with the proper signal.

Pavlov considers that there are three levels for the complex reflexes (including what are usually considered instincts); first, the subcortical ones such as emotion, fear, anger, defense, orientation, etc., those which are present after the extirpation of the cerebral cortex. Second are the conditioned reflexes, built on these lower ones, the signals in life for what has followed. Such reactions play the dominant rôle among the cortical phenomena of animals. But in the human we have a still higher set of symbols which adds greatly to the possibilities of complexity; in them there is a whole system of symbols for the more direct signals or conditioned reflexes—there are words which go to constitute the speech mechanisms. Conditioned reflexes in dogs can be built into only short chains of three to five signals which diminish rapidly in stability and potency the further removed they are from the unconditioned stimulus. But the word symbols in the human are capable of existing in endless chains forming almost an independent system in

themselves, so remote from the reactions which they were founded upon and intended to signalize that this relation is often hardly evident, can be traced with difficulty, and perhaps may cease to function, being subordinate to the new word system.

The past five years Pavlov has spent one or two days each week in the psychiatric clinic, and from this experience he has postulated that neurasthenia, psychasthenia and hysteria represent pathological disorders in three different strata of reflexes.

It is interesting to note that the philosopher-mathematician Korzybski has recently founded a school of thought called the non-Aristotelian system, somewhat analogous to Pavlov's word system. He refers to the reality of objects as the "extensional" system, and the word symbols that are built up on this as the "intensional," and he refers to the mistaking of terms for what they were supposed to signify as "identity," and his own non-Aristotelian system as "non-identity." Korzybski expounds the view that much of the confusion in human civilization results from accepting word signals for what they signalize. Pavlov explains only pathological states such as hysteria by false symbolization, whereas Korzybski would have us believe that practically every human ill arises from this cortical dysfunction of speech.

NATURAL CONDITIONS AFFECTING BEHAVIOR.

I have pointed out how we may produce artificially the processes of excitation and inhibition and nervous disturbances by a juxtaposition of them in time or space. Now I shall ask your attention to some "experiments of nature" which have altered both the ordinary behavior and the conditioned reflexes of the animals. Just as in the previous experiments, different individuals are affected not at all or in varying degrees depending upon the individual type. The first incidence of this was reported by Pavlov in 1925.³

During the flood in Petrograd in 1924, the animals were subjected to the severe strain of the terrific storms; they had to be rescued by making them swim from the kennels to the laboratory, where they were huddled together indiscriminately. Some of the animals showed no disturbance in their conditioned reflexes but those of the "inhibitory type" suffered a functional disturbance of the cortical activities for a considerable period of time.

³ Pavlov, I. P.: Lectures on conditioned reflexes. International Publishers New York, 1928.

Our case, occurring in 1931, was similar. The dogs escaped from their paddocks on the top floor, and were seen by the night watchman, Sunday, April 19, 1931, roaming over the building. He claimed that the dogs attacked him, and during the pandemonium they were badly wounded by him and intercanine scuffles. For a week afterwards three of the animals who were tested by the conditioned reflex method showed disturbances according to the type of animal. The most severe, occurring in a timid young collie, resembled a depression; the animal slunk in a corner with tail tucked, head hung, and would not respond to his master; the conditioned reflexes were almost abolished for several days. The second dog of the excitatory type was much subdued after this accident, and his differentiation between two metronomes was destroyed for several days, gradually returning to normal. The third was a stable bull dog, and, although badly bruised, he showed practically no change in his conditioned reflexes. In experiments with the action of alcohol on these three animals we found a somewhat similar gradation according to type.⁴

The sex act has little effect in our dogs on the conditioned food reflexes. Œstruation in the female and coitus in both male and female are not reflected in the intensity nor ordinary differentiations of the conditioned reflexes, including both positive and negative, that is, in the intellectual life of our canines, even though the animals in our laboratory were tried immediately following coition. It is perhaps needless to observe that copulation in dogs cannot be compared to coition and everything that this may involve in the human.

Pregnancy up to the hour of labor does not alter the intensity nor differentiations of the conditioned reflexes. But after labor and for the first few days postpartum there is a marked change in the behavior of the animal—in the experimental camera, extreme restlessness, whining, barking, panting, and failure of differentiation, the symptoms that we get in what Pavlov calls “neurosis” (Adolf Meyer prefers the term “tension states”), or a disturbance in the balance between excitation and inhibition. This continues

⁴ Gantt, W. Horsley: Effect of alcohol on cortical and subcortical activity measured by the conditioned reflex method. Bulletin Johns Hopkins Hospital, Vol. LVI, No. 2, pp. 61-83, Feb. 1935.

2-4 days, is much worse on the first and second days. Placing the puppies in the experimental camera with the mother does not relieve the symptoms. The unconditioned reflexes are little altered.

Surgical proceedings, *e. g.*, laparotomy, extirpation of an eye, seem to have no effect on the cortical reflexes, provided the condition of the animal is good. What a contrast we have here to the psychical traumata mentioned above. Abscesses, parotitis and such infections cause an amnesia, the artificial conditioned reflexes formed in the laboratory vanish temporarily to return as soon as the malady is over. Whether this is due to a special type of pain or to the systemic involvement we are unable to state.

Here a word should be said concerning the stability of our conditioned reflexes formed in the laboratory and their place in the dog's psychobiology. These are not only weaker than those inborn reactions, but also than the acquired reflexes elaborated earlier in the life of the animal. They are first to disappear under adverse conditions such as disease or the action of drugs. We have tried the effect of amytal, alcohol, etc., and find that the artificial conditional reflexes, such as the reaction to smell and sight of food are much more stable than the remoter signals used in the laboratory.

Fatigue, as shown by continuation of the experiment from the normal one hour up to eighteen or twenty, causes the conditioned reflexes to diminish somewhat in intensity, but the effect is not great; they do not suffer markedly even after twenty hours' work in the experimental camera.

III. TYPES OF NERVOUS SYSTEM.

Pavlov has for some years noted differences in his dogs, and at first he divided them into the four classical temperaments of Hippocrates. He considers that they fall roughly into excitatory and inhibitory as extremes, and a central group in which the forces of excitation and inhibition are equilibrated. The sanguine and phlegmatic represent the central normal group with the choleric and melancholic as extremes.

A later differentiation was into cortical and subcortical types, on the basis of whether the reactions were predominately those of the subcortex (primitive, emotional, inborn) or cortical (intellectual, capable of fine differentiations). Many of the first would

constitute our psychopathic personalities with their strong aggressive, antisocial traits, primitive and uncontrolled appetites and passions; whereas the cortical type represents the highly educated and cultured with their diversified interests, inhibition of primitive excitations to attain a goal, perhaps very distant. To say that all of the latter are acquired and the former inherited is a general distinction though perhaps not altogether correct.

The division between weak and strong types is made on the basis of the regularity and stability of the conditioned reflexes, and the ease with which they are extinguished—that is the adaptability of the animal to its environment.

IV. THE PAVLOVIAN, FREUDIAN, AND MEYERIAN SYSTEMS.

Pavlov and Freud both make use of the principle of conflict; with Pavlov the conflict is between cortical processes of excitation and inhibition, which either because they come too close together or because of the weakness of the nervous system of that individual, may result in a disturbance of the balance in the suprasegmental reactions. Pavlov's theory is simple, mechanical, and proceeding as it does from work on the dog, requires no postulates such as the unconscious, infantilism and sex life. Moreover it has been evolved chiefly on the basis of investigations of the food reflex, to a less extent the reflex of defense. We have seen how these two systems alone can in the dog produce nervous disturbances without any reference to the sexual instinct. This seems to be more concentrated, less diffuse, in animals than it is in humans. However, it does seem important for the mechanism of the production of nervous tensions that they can be caused by a conflict, a difficult differentiation, without reference to the nature of the underlying unconditioned reflex. Whether all of these are equi-potential in the conflicts that are based on them is a question that remains to be answered.

In applying the methods of Pavlov experimentally to the adult human we encounter difficulties. In the first place, with the human the food reflex is relatively subordinated to other more prominent social instincts. Secondly, there is a much stronger investigatory reflex in man so that we can never isolate the observer from the subject during a direct experiment. Thirdly, inhibition is more

marked. Fourthly, speech complicates the picture, which, as we have mentioned, occupies a dominant place as an almost independent system in the human. An angry look or gesture is a conditioned signal for inner processes of which every layman may be well aware, but once let the corresponding word signals be uttered or written, although plainly equivalent, and they become a source of such irritating preoccupation and elaborations that the floods of years may not wash them out. On the other hand, how much of human action is determined by a phrase or a tenet!

The psychobiology (or ergasiology) of Adolf Meyer and Pavlov's conditioned reflex methods have a common denominator in that they both have an objective point of view. However, the facts of Pavlov's objectivity are experimental and exclusive, whilst Meyer's are those of an indirect experiment, obtained by observing an experiment of nature, inclusive. Pavlov limits the conditions and uses physiological methods; Meyer does not depend on any one method, but is content to observe empirically, and to emphasize the importance of common sense in every-day experience. Pavlov, in considering psychical phenomena as governed by the same natural laws that hold for the physiological reflexes, is monistic rather than dualistic, while Meyer, taking into account all the available data and giving each a hearing and place, is pluralistic.

By the conditions of the strict methodology of science, Pavlov is obligated to confine the experiment to a few variables, in order to simplify. Scientific laboratories feel on sure ground when they have only several variables from which to make their computations. The dog must be put into a psychical strait jacket, the environment standardized, and the measurements are either positive or negative and quantitative. In the experiment of nature everything is considered and the conditions are not limited. Both Freud and Meyer, being psychiatrists, may concern themselves with an inner biography of the patient. With Meyer every fact that might have a bearing stands on its own merit, none are slighted in order to make room for others more alluring. Moreover none may be magnified; the tail must not run away with the dog, the part must serve the whole and not vice versa. There is a kind of Communism of laws and biological facts where balanced judgment sits as dictator; enticing theoretical interests may not suppress and exploit the more natural and therefore often less evident factors. Doubtless many

patients have reason to be grateful for this tolerance that does not stretch them out nor chop them off to fit the Procrustean bed of theory.

But the experimental method must have a theory and an hypothesis on which to swing its facts, and the whole progress of the elemental sciences consists in building up theories only to be torn down and reconstructed in order to house newer data.

V. DILEMMA OF SCIENCE: CONDITIONALITY IN PSYCHOBIOLOGY.

Now we come to the dilemma of the experimental method. In any experiment where we limit the conditions, we deal with a part only of the organism, otherwise we can not find out the desired mechanism when uncontrolled factors are at play. We attempt to exclude all but one or two variables in order to see their reciprocal relations. Even with inorganic objects our experimentation, as pointed out by Jeans, changes the nature of the materials, and more so in psychobiology does the introduction of stimuli alter the animal. The smoke rings blown from our scientific pipe in the seclusion of laboratory meditation, suddenly, when we open the window of life, get caught up into the vortices and cross-currents created by the multiple forces of psychobiology, and may not preserve their same ideal forms as they did in the quiet of the laboratory. Our experiments, then, can give us hints and suggestions rather than implacable truths.

There is still another factor to be considered and that is the possibility of handling multiple forces by the mathematical formulæ toward which science strives. Ordinary mathematics expresses relations between two or three quantities when the rest of the cosmos remains uniform, but if the number of forces increases greatly the mathematics becomes too involved to encompass them satisfactorily. The success of the astrophysicist undoubtedly proceeds from his dealing with such distant events that nearly all their qualities fade out except those one or two functions that get across stellar space and down a telescope. Fortunately in our earth mechanics, and often also in psychobiology, there may be only two or three dominant forces, and our science is then practically adequate.

Einstein has shown us that the absolute must give way to a concept of dependence on point of view of observer as well as the relations of the observed objects. The laws of Euclid and Newton

were true for that generation, with those instruments; they brought into harmony what facts were discovered then. Finer instruments mean greater precision, and the old theories no longer hold. And what is true today will not be a generation hence.

We recognize that what were considered as immutable laws in physics and chemistry are conditional and relative. Water between 0° and 100° has well-known properties, but change either one factor, pressure or temperature, and we have a substance so different that we would not recognize it as the same unless we could reconvert it. All the laws of physics and chemistry are dependent not only on earth chemistry, but on earth conditions within a narrow limit. Increase only the one factor of temperature and we get a world of vapor where most of the present scientific laws of properties of substances do not obtain, *i. e.*, we have a new universe. Even the laws of elasticity of a rigid substance like steel are valid only under certain narrowly limited conditions.

Relativity, or conditionality, in biology and psychobiology is of even more importance. Weber's law, for example, is cogent only for a normal organ and furthermore with stimuli of certain intensities, *i. e.*, for the conditions that are similar to those under which it was elaborated. There is one law for the earthworm, another for the fish, and still two more for the idiot and the genius. For the earthworm to be cut in two means life; the fish sees the objects of our world as suspended in a 90-degree cone; but the philosophy of the earthworm or the piscatorial point of view does not satisfy us. For none of them is reality so imperturbable that it could not be completely revolutionized, all the old concepts overthrown, by the introduction of a single new sense, or in our case perhaps of even a new instrument. Reality, ultimate truth for each is what *he* sees with *his* eyes, hears with *his* ears, can synthesize with *his* cortex. Fortunately most of us who call ourselves scientists can agree on a working definition of temporary truth.

We are now ready to abandon the quest of ultimate truth in physical sciences, and should be the more so in psychobiology; we are content to let reality flow on unfathomed except for the ripples that we can see on the surface; about the depths we can only guess. And even with what we see we must not be too pretentious, but by the psychobiological formula,

$$\text{Self-esteem} = \frac{\text{achievements}}{\text{pretensions}},$$

we can raise our self-esteem by lowering our pretensions as regards final truth. Otherwise we see nothing but confusion from the multiplicity of theories and dogmas when we witness science rejecting what yesterday it swore by. Absolute truth being, then, an unobtainable goal, we shall be satisfied when we have a formula which accounts for all the facts in hand. This theory must be our standard truth until instruments and methods of finer precision bring us new facts and relations. Our shifting truth, like the conditional reflex, is good under the conditions of the experiment. If we have observed carefully, thought clearly, taken into account all the data, we can do no more until the time when a new method or point of view will show us an approach which did not exist with the old set-up. Our conditional truth becomes thus determined by instruments, methods and observer, as well as by the observed organism. The important question is not,—Is this or that law true, but—Under what conditions was this law formulated and *in which circumstances* is it true, *i. e.*, its conditionality.

What was at first baffling now heartens us—when we know that an absolute formula is, like infinity, a figment of the imagination; but that relative truth, satisfactory for our work even in the difficult field of psychobiology, is not the monopoly of the few but within the reach of every careful observer and clear thinker. Although we may have lost the vision of an everlasting truth, this does not necessarily compel us to a nihilistic view. By directing our efforts toward what is at hand, collecting and arranging available facts, with the sense that what we can do is under the circumstances the best, we arrive at a conditional formulation, and with this as a starting point we may proceed until a broader horizon enables us to discard our formulation for a better one. This movement from one conditional truth to another, always in conformity with the milieu of methods, instruments and current knowledge, is certainly more exciting and dynamic than a fruitless search for the philosopher's stone of eternal truth, which, if found, would leave us as mental automatons in a world of stagnation.

PSYCHIATRY IN AND AROUND ST. LOUIS.

By LELAND B. ALFORD, M. D., ST. LOUIS, MO.

In Missouri psychiatric institutions are under the two administrations, that of the state and that of the city of St. Louis. Under state control are four hospitals for the insane and the state school, and under the city's supervision are the large City Sanitarium and the Training School. At the present time as a result of the approval of bond issues the administrators of both state and city hospitals are engaged in or actively planning a rehabilitation and building program to cost an aggregate of perhaps twelve million dollars. Since expenditures on the institutions had long been kept to a minimum, plants in many instances had become antiquated to a dangerous degree and space under increased depression demands had become greatly overcrowded.

THE STATE INSTITUTIONS.

The state institutions are the Fulton State Hospital, the St. Joseph State Hospital, the Nevada State Hospital, the Farmington State Hospital and the State School for the Feeble-minded and Epileptic at Marshall, established respectively in 1847, 1872, 1885, 1903 and 1899 and having respective populations of about 1700, 2500, 1700, 1200, and 1200, which figures represent overcrowding of almost 40 per cent. The nearest of these hospitals to St. Louis are Farmington about 75 miles and Fulton about 100 miles distant.

The administrative setup of the state's hospitals has varied from time to time. At the present moment there is a bi-partisan Eleemosynary Board consisting of five unsalaried citizens and a full-time secretary, the latter position now being held by Mr. W. Ed Jameson with offices in the capital, Jefferson City. Appointments to the board are made by the governor and the board in turn appoints the superintendents and otherwise supervises the hospitals. For a few years there was a full-time psychiatrist to the board and later for a period the late Dr. M. A. Bliss, a psychiatrist of St. Louis who was much interested in institutions was a member of the board.

The penal institutions are supervised by a penal commission of three consisting of the director of the department, the head of the parole board and the supervisor of farms, all appointees of the governor.

In 1929, moved doubtless by the glaring need and probably under the urging of Dr. Bliss, Governor Caulfield caused a bill to be passed by the legislature creating a commission to study all of the building needs of state institutions including state hospitals, penal institutions, the university and teaching colleges. This commission, consisting of prominent laymen, submitted its report in November, 1929. Before further action could be taken there was a change in the state administration and Hon. Guy B. Park became governor; but ex-Governor Caulfield, continuing his interest visited the capital and urged Governor Park to sponsor a bond issue of twenty million dollars for the eleemosynary and penal institutions. Governor Park further encouraged by the prospect of a supplementary grant from the federal treasury then recommended a fifteen million dollar bond issue to the legislature and the final result was that in May, 1934, an issue of ten million dollars was approved by the electorate. To this amount the federal government added almost four million dollars. Of the total amount 58 per cent has been allotted to the eleemosynary institutions (which include two smaller institutions besides the psychiatric) and 42 per cent to the penal institutions.

The act authorized a building commission consisting of the governor and heads of state departments but the actual direction of operations has been placed in the hands of an unsalaried bi-partisan Advisory Board of six prominent citizens, voluntarily created by the governor. This board authorized a detailed survey of needs and for this purpose called in Dr. Burdette G. Lewis, a man of large experience in civic and corporate organization and administration and the one largely responsible for the present setup of the Department of Public Welfare in New Jersey. Dr. Lewis' report was completed in January, 1935, and included detailed recommendations for the rehabilitation and new building needed by each institution and as well an excellent study (conducted by a psychologist, Dr. Theodore F. Lenz of St. Louis and others) of the work potentialities of the prison population. It is to be noted that Dr. Lewis' survey was limited in advance largely to plant require-

ments and therefore his report entered very little into broader policy either psychiatric or penal. In addition the late Dr. Hart of the Russell Sage Foundation and one or two others have given advice to the various boards to a limited extent.

Dr. Lewis' recommendations, it seems, are not being followed in all details by the Advisory Board. In one notable instance a second penitentiary is not being erected distant from the present one, the latter, an antiquated group of buildings some hundred years old to be mostly abandoned, as Dr. Lewis recommended; but instead the present plant is being extensively remodeled and additional buildings erected nearby, at a cost of nearly six million dollars. Again the Advisory Board has conceived the plan of having reception buildings which are in effect psychopathic hospitals in connection with each of the state hospitals, under the conviction, as is stated, that the discharge rate under the psychopathic hospital method of treatment is far higher than under the state hospital method and that a great saving is thus secured. The penitentiary also is to have a diagnostic admission center. These, it appears, are the only considerable changes in methods of treatment either eleemosynary or penal instituted in the course of the program.

It is understood that when the building program is completed there will be very little space over and above present needs; future requirements, if they prove to be larger than the present ones, being left to take care of themselves as best they may.

THE INSTITUTIONS OF ST. LOUIS.

The City Sanitarium, founded in 1867 and located near the southwest city limits has a capacity of about 2300 patients and a present census of 3516. The Training School for the Feeble-minded, completed in 1924 and located a few miles north of the city contains about 500 patients. The City Sanitarium is fed largely from the observation ward of the City Hospital which is attended by unpaid visiting psychiatrists and which, incidentally, has under heavier depression demands become a local scandal, if temporarily an unavoidable one.

These two institutions, as well as the City Hospital, the Koch tuberculosis hospital and the Isolation Hospital, are under the direction of the hospital commissioner, a physician by tradition and an appointee of the mayor.

In 1932 the authorities of the city's hospitals made moves towards putting through a fifteen million dollar bond issue but were unsuccessful. The matter was again taken up by the new authorities when the state made its movement and at the same election with the state a bond issue of seven million dollars (a part of a sixteen million dollar issue) was voted for all of the city's hospitals. To this amount the federal government added three million.

The exact amount to which the psychiatric institutions will benefit is not yet determined. The city is erecting its buildings one or a group at a time and is completing its specifications in similar sequence. The first building to be constructed is the psychopathic hospital, but it is the present plan to erect buildings for tuberculous patients before the additions to the City Sanitarium are made. It is tentatively estimated that about three million dollars will be allocated to this institution, an amount, incidentally, that, allowing an estimated two million for development of the present plant, leaves only one million for increased bed capacity. Evidently overcrowding will not be completely taken care of under the present bond issue and it will be years before partial relief is obtained. Since an arrangement exists with the state, some patients may be transferred to the state's hospitals as these are completed.

The specifications of the psychopathic hospital are now practically complete. It will be erected adjacent to the City Hospital in the central section of the city and will have a capacity of 250 beds. Its cost is placed at \$1,200,000 and it will be modern and adequate in every respect, being modelled closely after St. Elizabeth's in Washington. Space for child and adult outpatient departments, occupational and physical therapy, etc., has been provided. It is planned to have a considerable salaried personnel of psychiatrists. The institution should be open to receive patients in about two years.

COMMENT ON STATE AND CITY PSYCHIATRIC POLICIES.

Readers undoubtedly will see much to criticize in these various procedures and policies of the city and state. Obviously not enough expert psychiatric and penological guidance was sought in connection with the preliminary surveys and the completion of plans, and it is regrettable that along with construction studies such mat-

ters of broad policy as family care, home placement, out-patient care, research, tenure of personnel and penal probation were not also investigated. With both officialdom and the electorate at last in a complaisant mood, a thorough and advanced program of psychiatric care and treatment might with a sufficient background of information and advice have been instituted.

One instance may be mentioned. Dr. Hamilton sounded the warning at the last meeting that expenditures for the states' wards were almost sure to be drastically reduced in the near future and that therefore new and cheaper methods should be found immediately. Extended extramural care seems to be one promising solution. One consequently cannot but question whether St. Louis under the circumstances is justified in building an elaborate psychopathic hospital which inevitably will have a high subsequent overhead. With a modest but efficient psychopathic hospital, a greatly enlarged and perfected out-patient department and facilities for returning patients to their homes early might at the same time solve problems of finance and service.

The reform most needed by both city and state, apparently, is a civil service that really works. Those in control are now frequently too inexperienced, have too little power and are in office too short a time to be able to visualize and put into effect indicated or promising measures. Penal probation, for example, requires an elaborate and efficient machinery and a long time for its successful installation. For another thing under the present system the entrance of political expediency has been apparent from time to time and a political raid may occur at any moment. The state has no sort of civil service and the city one that exists only on paper. Perhaps the agitation for the merit system now abroad will aid towards attaining this goal..

The St. Louis Medical Society has appointed of its own volition a committee of practicing psychiatrists to be available whenever called upon for advice by either city or state. It is felt that such a committee would be a valuable permanent adjunct to the present or any other system.

EXTRAMURAL PSYCHIATRY IN ST. LOUIS.

Neuropsychiatric private practice in St. Louis has developed along much the same lines as in other cities of this section and with

very few outstanding features. Dr. Jerome K. Bauduy and Dr. C. H. Hughes were the first two specialists in the local field, launching the specialty soon after the Civil War. The interest of both was, it appears, predominantly psychiatric. Dr. Hughes founded *The Alienist and Neurologist* which was announced as designed to instruct the general practitioner in neurology and psychiatry and which, it is worth noting, continued publication for some forty years. As the city grew the number of specialists increased and the preparation of individuals improved, several taking courses in European centers. A great deal of the psychiatric activities has been centered in the two medical schools of the city, St. Louis and Washington Universities, although neither has any special psychiatric establishment.

For some years the primary interest of the city's neuropsychiatrists was obviously in the sphere of organic neurology while psychiatry remained a side line of practice but not of study. But in recent years the trend has been in the other direction, the younger generation being more interested and better trained in psychiatry. There is no psychoanalyst in the field. Dr. F. M. Barnes has confined his work to psychiatry and, incidentally, in 1923 produced a text book of psychiatry which was adopted by a number of medical schools in this country and abroad.

For many years one of the dominant figures in the St. Louis field, as indeed in the entire country, has been Dr. Charles G. Chaddock, still widely known because of his contribution of the external malleolar and other signs to the neurological examination. In his early days Dr. Chaddock translated Kraft-Ebing's three works, *Insanity*, *Psychopathia Sexualis* and *Hypnotism* and von Schrenck-Nötzing's *Suggestive Therapeutics*, as well as writing or contributing to works on psychiatry and legal medicine. For many years Dr. Chaddock made a practice of spending his summer vacation periods in the clinics of Paris, Babinski's being his favorite. A great student and a linguist of parts, whose pastime is the reading of old French, Dr. Chaddock has based his continual original investigations upon a thorough knowledge of developments in all lands. Even now, although for several years in semi-retirement, Dr. Chaddock continues to conduct studies on new reflexes. Such attainments and such unswerving scientific interest are rarely encountered and it is the plan of the St. Louis committee to make

the forthcoming meeting of The American Psychiatric Association an informal tribute to Dr. Chaddock.

There are a number of neuropsychiatric divisions in connection with hospital out-patient departments and the city runs a child-guidance clinic. Several of the general hospitals have wards with barred windows and doors for disturbed patients. Alexian Brothers Hospital conducts quite a large department for male patients and St. Mary's has a useful ward with inconspicuously barred windows but without locked doors, where patients may be kept in safety without knowing they are really in a neuropsychiatric division. A comparatively recent development is the opening of numerous nursing homes, consisting usually of a house in charge of an enterprising nurse, where mildly psychotic patients may be kept at reasonable rates. This development really amounts to unofficial family care.

The Missouri Welfare League, founded in 1920, of which the guiding spirit is Miss Carol Bates is devoted to the improvement of the penal institutions and the prevention of crime. The membership is about 400. The League has worked faithfully against discouraging obstacles and has to its credit the Intermediate Reformatory, Algoa Farms (1927) and numerous minor reforms and benefactions.

The Missouri Association for Occupational Therapy conducts a school, one of five in the United States and Canada, is very active in placing occupational therapy in the various hospitals, private and state, and conducts a home service department for home-bound patients. Miss Geraldine Lermitt is the very capable director. A quite large workshop for out-patients, private and clinic, is supported by the Junior League. Some years ago a building on Scott Avenue worth about \$100,000 was donated for the use of the Association and Workshop.

St. Louis has a branch of the Mental Hygiene Association which is active in educational work for the public.

RELATION OF TRAUMA TO MENTAL DISEASES.

BY ABRAHAM MYERSON, M. D., BOSTON, MASS.

In medicolegal practice, the question frequently comes up of the relationship of an antecedent trauma to a subsequent mental disease. Trauma as related to the group of conditions, called the traumatic psychoses, needs no consideration at this point further than to say that in these cases trauma to the head is usually considerable, and the establishment of a mental disease of a more or less separate type is immediate. There are classical studies upon this condition.

Nor do I take up at this point the traumatic neurosis with all its difficulties in establishing cause and effect. An emotional state engendered by pain, fear and, generally speaking, physical and mental suffering may logically be said to establish a neurosis, since we seek for the causes of this condition mainly in environmental relationships admitting, of course, that a peculiar constitution predisposes.

Nor am I considering the relationship of trauma to general paresis. We have here the typical situation of a pre-existing pathological condition and then the question of something which lights up or sets off further pathology to the point of the establishment of a psychosis. My own practice has been to disregard as etiologic in the precipitation of general paresis any trauma except to the head and to consider as precipitating or accelerating only those injuries which create unconsciousness and may be assumed to have changed brain conditions in an organic way.

It is the relationship of trauma to such psychoses as manic-depressive and dementia præcox that a rather disastrous situation exists at the present time in the courts—disastrous I mean to justice and to the prestige of psychiatry and psychiatrists. Here we have two conditions which, so far as our present knowledge goes, have no definite relationship to environmental conditions, in which heredity and constitution may be definitely stated to be the only factors of etiologic moment of which we know anything of importance. That heredity plays a rôle in the production of manic-

depressive psychosis need no longer be doubted. That constitution, whether hereditary or not, is the great factor in dementia præcox is, on the whole, unanimously proclaimed in the psychiatric literature. There is, so far as we can see it at the present time, a certain inevitability about these two mental diseases which sets them off from the rest of the psychoses and which has given rise to their classification as endogenous.

That an external event may precipitate either or both of these types of mental disease is, to some extent, in question. It may be assumed for the purposes of the commonsense relationships of law that where there is a serious injury resulting in severe pain and suffering, and where the mental disease—manic-depressive or dementia præcox—follows in rapid sequence that there is some relationship between the trauma and the psychosis. Thus, where a man, as in one of my cases, has been thrown from a ladder by the impact of an automobile, fallen 20 or 30 feet, fractured his skull, been unconscious for 24 hours, and then has shortly developed a dementia præcox syndrome, it would be unreasonable to state that the previously industrially efficient and socially adequate individual had not been affected by the trauma in sufficient degree to cover the legal requirements of precipitating or accelerating cause.

If an individual has been subjected to severe emotional stress and strain, let us say, by a fire in the building in which he works, has inhaled much smoke, been drenched with water, but receives few burns, and then develops an acute maniacal excitement which goes on finally to a typical manic-depressive attack, it can—I think—safely be said that the emotional strain, the excitement, the fear, precipitated the cyclothymic individual into a manic-depressive psychosis.

I cite three cases in my experience in which it seems to me unreasonable to assume that a relationship existed between the trauma and the experience and the subsequent psychosis. Let us take a situation such as the following:

CASE 1.—A woman, who has within four days been delivered of a fourth baby, orders some pie which is brought in from a neighboring chain store. Unfortunately, there was a small tack in the pie. The woman bit into it and, according to every account, the most substantial injury which she obtained was possibly a slight cut of the gum, which a physician saw within an hour and considered of trivial importance and, in fact, which healed up without any sequelæ. Just what happened in the intervening three or four months is

open to doubt, in that the family claimed she became increasingly nervous until three days before her admission to a state hospital. On that day she woke up, thought the religious pictures in the room were alive, became wildly excited and agitated, and was committed to a hospital where she remained for about a year, running through a cycle which was diagnosed as manic-depressive psychosis. The family omitted to make any mention of the tack injury at the time of her admission to the hospital but laid stress at that time upon a financial disappointment. It seemed that the patient, who was a bootlegger, had accumulated some money, was negotiating for a house, and through some misadventure the bank refused to give a mortgage. She became quite excited, and it was a few days subsequent to this that the manic-depressive attack appeared.

At the trial two psychiatrists of excellent standing testified on substantially this hypothesis—that the bite into the tack was the precipitating cause of the psychosis, excluding as relevant or important the factor of the pregnancy and the financial disappointment, and taking into account that the record of the hospital in which the patient stayed a year laid no emphasis whatever on the injury by the tack and laid its emphasis upon the financial disappointment as given in the history by the husband of the patient.

It seems to me that here is a violation of anything corresponding to the laws of cause and effect, if we accept, as psychiatrists must do, I believe, that there is a cause and effect in psychiatry. It may be that there is universe of variables behind any case of general paresis, but without any invasion of the spirochete pallida within the brain or the body no psychosis develops. So we state, perhaps naively, that the general paresis is *caused* by the spirochete pallida. A man ingests alcohol, develops a psychosis in which he hears voices calling him names, becomes quite agitated and excited, believes that he is being persecuted, and as the effect of the alcohol wears away, he recovers. We say, then, that the alcohol caused his psychosis although we recognize that playing upon that individual was a universe of things which may have related to the psychosis, but we also believe, as a result of clinical experience, that without the alcohol there would have been no psychosis. In other words, psychiatrists living in a practical world seek cause much as a plumber will find the cause of a leak in a pipe, namely, the fact that the wall of the pipe has rusted away in a certain place through which the water finds exit. Accepting, therefore, the concept of cause and effect as playing indispensable rôles in our thinking and in our handling of patients, in how far does a manic-depressive

attack, lasting a year, and which comes on three months subsequent to the trifling injury inflicted by the tack in question stand in the relationship of effect to the injury as cause?

Manic-depressive is enormously constitutional. That can be stated at once. The main cause, so to speak, lies in the nature of the individual. By the side of this fact, whatever environmental exigencies occur are, on the whole, minor. Thus, it stands in a different relationship of cause and effect to the fracture of a skull by a brick. The thickness of the skull plays a rôle in the fracture which results from the impact of the brick upon the skull, but we cannot conceive of the skull being fractured without the brick, and skulls are not fractured unless there is external violence; and so we may say that external violence is the environmental cause of the fractured skull. We cannot say the same of manic-depressive psychosis. Here we may also contrast it to a neurosis following arduous exertion, great fear and worry, and a tense and exhausting social situation. Undoubtedly, not all persons would develop a neurosis under such circumstances. Nevertheless, the situation is of importance in bringing about the neurosis, at least by our present clinical criteria.

But the cause in the case cited above is trifling. It is too disproportionate to be given a value. If a chain of events is set up between the injury and the psychosis, the chain has too many weak links. It is fundamentally too artificial to be of validity. Moreover, a statistical study of manic-depressive psychosis would show no other cases precipitated by such injuries, or so few in comparison to the total number of manic-depressive as to relegate the rôle of the tack to that of coincidence. Whatever logic is used in the case excludes the tack as of importance. It cannot be excluded as having some bearing, but in view of the general nature of manic-depressive and the total constellation of events surrounding this particular case, or any similar case, the most that can be said is that of a possible minimum relationship which does not cover the legal necessities of probability.

CASE II.—Is that of a young man, 21 years of age, who for several years had shown character peculiarities. He had run away from home on several occasions and, in fact, found it impossible to live at his home. He was definitely of a closed and shut-in type. It was testified to that on the day before the incident which was claimed to be the inciting event for his psychosis that he

had been seen to go up and down in an elevator on two or three occasions without any definite or known purpose. He had no friends; his participation in social affairs was nil. On a certain morning, fire broke out in the plant in which he was employed; not in the building in which he worked, but in a distant building. There was considerable excitement; no one, however, was injured or burned. The boy helped drag some hose, and from a very safe distance helped throw a stream of water upon the burning building. There was some degree of exposure to smoke; some of the water of the hose dripped upon him and wet him. He was not struck; he was not suffocated; he was exposed to no danger. The next morning it was noted at his home that he acted peculiarly. He would not eat; he went to the factory, stayed around a little while, talked incoherently, spoke of fire, took poses, acted as if he were hearing voices, and within 24 hours was in a state of great excitement, as a result of which he was taken to a hospital.

In the hospital he assumed catatonic poses, was resistive, was in the tubs for weeks, had to be tube-fed at times. Finally, he simmered down to a case of dementia præcox, and at the end of five years he is still in the institution, disoriented, deluded, and undoubtedly permanently psychotic.

It was testified in this case that the excitement and the trauma (which consisted of being wet and inhaling in a wide open space some CO₂) precipitated dementia præcox; that without this excitement the individual might have gone along for years without having his psychosis, although undoubtedly he would, sooner or later, have presented his mental disease.

Here we deal with a situation probably even more against the realities than the case of manic-depressive cited above. Whatever we know of dementia præcox indicates that an individual who has shown the schizophrenic constitution or the shut-in personality may suddenly develop a psychosis; that this is a common beginning rather than one that is exceptional and especially in the case of the catatonic onset. In other words, there was nothing in this case that differed from the clinical history of many a case, uncomplicated by medicolegal difficulties. Secondly, the result was, on the whole, disproportionate to the cause, especially in dementia præcox. That is, we can safely state that even the unusual environmental relationships, such as those which occur during war, stress, strain and excitement do not seem to increase the number of cases of dementia præcox; that, on the whole, it proceeds independently of such situations. On this basis, we can state further that the psychosis and the fire were coincidental rather than standing in any cause and effect relationship. Furthermore, if it is assumed that the individual was in such a delicate state of balance, so to speak,

that the fire upset him into a psychosis, then we can also affirm that it is inconceivable that he would not have been precipitated into that psychosis within a relatively short period, and that the fire had an effect possibly, but one which was lost and merged with the total picture in a very short time. In other words, the duration of the effect caused by the fire can be minimized logically into a very minor matter.

Post hoc propter hoc is as reprehensible in psychiatry as in any other clear thinking branch of science. It would have to be shown that a considerable number of cases of dementia præcox are precipitated by excitement, such as that of a fire, before this one case can be set up as establishing a basis of causal relationship between the fire and the subsequent psychosis.

CASE III.—Is that of a man, 52 years of age, who has at present an involutional type of psychosis. The patient believes he has syphilis; that he is being punished for an adulterous relationship which dates back to his thirtieth year of life; that he is to be taken out and killed; that he has caused all the evil of the world; that he has no bowels; that the world is definitely altered, because of his sins. Especially does he attribute to his masturbation as a youth the sad condition of his son, who is a patient in the same hospital and who is classified as a case of dementia præcox with sexual perversities. The cause of his present psychosis is attributed by his relatives and substantiated by the statements of physicians of different types, and especially one psychiatrist, to the fact that he had a herniectomy three months before his entrance to the hospital. The herniectomy was successfully performed; the scars are inconsequential; the net result is very definitely a successful operation.

The history of the man shows that for at least six months prior to his admission to the hospital he had been greatly worried, depressed and agitated. For three months before the herniectomy he had had nose-bleeds of such severe type that he would have to go to a hospital. When he visited the hospital in which he is now incarcerated, it was noted that he seemed very gloomy and brooding, and tended to accuse himself because of his son's condition. On the commitment paper the wife's statement is to the effect that three months before the herniectomy he had been brooding; his sleep was disturbed; and he was self-accusatory. The industrial history of the man shows that he had been losing ground as a worker for a period of six years prior to the operation. Up to that time he had worked steadily. He had a record of 14 years in one factory, and six years in another. From 1928 he had had half a dozen jobs, had been out of employment a great deal, and had worked at occupations requiring less skill and receiving much less pay than his previous occupations. The herniectomy was for small bilateral herniæ of indirect inguinal type said to have followed his occupation.

Excluding from our consideration whether or not the herniæ were due to his occupation, in how far can it be stated that in a

case of this kind, the operation produced, or was a factor in, the involutinal psychosis. In the first place, there is clear-cut evidence of downward trend in the man's personality and in his social adequacy for a considerable period of time before the operation. In the second place, at the time of the commitment the operation did not seem of sufficient importance to the family or the committing physicians to be even mentioned. In the third place, we can safely state that in such breakdowns as this environment plays but a small rôle; that rich and poor, successful and unsuccessful, have involutinal psychoses of this type, and that there is enough in the family history to indicate his general constitutional weakness.

It is possible, so it seems to me, to set up the operation as an aggravating factor. It does not seem to me, however, that it can be stated as a probable factor. In other words, where constitution is the most important etiology, we have to assume something extraordinary and something which breaks down what seems to have been a perfectly intact individual beforehand, before we can postulate any relationship between the event and the psychosis. In this case, the condition is clearly lacking for the establishment of such a relationship. The individual was sick before and the event itself was not extraordinary, nor in the ordinary course of events to be regarded as of serious moment. In fact, the relief from the herniæ would certainly more than offset whatever trauma the patient was exposed to by virtue of the operation.

In relationship to these situations, I have established for myself the following guiding principles: first, that wherever a psychosis is mainly of constitutional origin, and where medical science is as yet unable to find any direct environmental relationship, I am reluctant to state that any environmental event is a probable exciting or precipitating or aggravating cause. If, however, an environmental event occurs which is of serious nature, such as severe trauma or of great emotional significance, and if it can be shown that the psychosis occurred within a very short period, I am willing to admit some relationship. This is true, however, mainly of manic-depressive psychosis. I am willing to admit as a probable cause a psychological event as a cause for the occurrence of this psychosis. Manic-depressive is mainly an affective psychosis. It is, therefore, perfectly logical to assume that a serious emotional situation, such as great strife between a husband and wife, some

profound humiliation, some extraordinary fear may, if immediately followed by a manic-depressive state, be a precipitating or aggravating cause. I am unwilling to admit that we have any reason to assume that this is a factor in the precipitation of dementia præcox, largely because the schizophrenic state is not, so far as we know, emotional in its origin, and that the personality alteration is of more profound nature than the change which takes place in manic-depressive psychosis.

DISCUSSION.

DR. BERNARD GLUECK (New York City).—Whenever I listen to a presentation of this topic at the hands of my medical colleagues I cannot escape the conviction that we, as doctors, bend backwards in the expression of leniency towards the place in this problem of legal medicine or medico-legal practice of our friends, the lawyers.

If we were more realistic in our approach to this question we would recognize that there are two distinct aspects to it, one a strictly scientific aspect, and the other essentially a problem in ethics. By training, tradition and experience the lawyer approaches these questions with a contentious set of mind. He spares no effort to force the medical expert into a similar position, and no matter how determined the doctor is, in such situations, to adhere strictly to the scientific aspect of the situation, he commonly finds himself, before he is aware of it, in the position of partisan to a contested issue.

It seems to me that there is no promise of a solution to this question unless we as physicians come to insist definitely that whereas there are honest differences of opinion possible in the field of medicine and between doctors, our problem, nevertheless, is not a legalistic and contentious one, and that to the physician, at any rate, the idea of experts of both sides cooperating in the discovery of the truth at the bottom of a medico-legal issue is a perfectly logical and consistent attitude. The lawyer seems to have an insuperable difficulty in accepting this point of view, and insists upon the doctor aligning himself with one or the other side of the question.

For the past six years or so I have regularly refused to participate as an expert in any medico-legal issue unless I could testify for both sides, that is, unless I could confine my function to an examination of the facts and a presentation of them, irrespective of the effect on one or the other side of the case. Naturally, I have been consistently informed that my services, if they were to be of that type, were not wanted.

Last autumn we had a symposium at the New York Academy of Medicine on the question of the relation of psychiatry to the criminal law. My *vis-à-vis*, the gentleman who represented the legal side of the question, a professor of criminal law in one of the leading eastern universities, stated, among other medievalisms that he had to tell us about, that he could not

see why a psychiatrist should have more justification for the expression of an opinion on criminal conduct than say, an architect. He also stated in the course of his presentation that such questions, for instance, as social security, cannot stand in the way of meeting the requirements of the law as it stands. You are welcome to draw your own conclusions from statements such as these, made by a representative of the legal profession, concerning the attitude which modern law has towards this problem.

In my opinion the solution of this problem will be very slow in coming, although theoretically it should be easily achieved, if we are to wait for a fundamental change in the philosophy and outlook of the criminal law. We have it, it seems to me, rather in our own hands to solve this problem if we, as physicians, simply refuse to participate in those legal fictions which regularly characterize and dominate procedure in medico-legal practice. It is this that I refer to as the problem in ethics.

Two very interesting and important cases have been recently disposed of in the state of New York. One is that of a man who had committed a number of murders of small children, and in addition has practiced for many years all sorts of strange and morbid masochistic self-inflictions. I did not examine the man, but from the facts that were available to the public at large any ordinary layman would have been impressed with the pathology involved in this situation. Nevertheless, we had the spectacle of two groups of eminent and capable psychiatrists permitting themselves to be dragged to the level of an ugly partisanship, the one insisting that the man was insane, and the other that he was totally responsible for his crime, the latter succeeding in having the man committed to the death house at Sing Sing.

The other case was that of a man who was about the most profoundly distorted individual, the most glaring polymorphous pervert, who for many years lived out his perversions in a cruel and dangerous manner to society. He was suspected of murdering his wife, and when arrested in one of the European capitals quite an arsenal of instruments of torture, which I saw exhibited at the psychopathic hospital where the man was under observation, was found in his possession. Now there may have been room for doubt as to the precise psychosis from which this man was suffering, but there certainly could be no doubt in anyone's mind that we were dealing with a man whose morbid propensities constituted a distinct menace to society, and a realistic approach to the problem would have been to confine this man to a mental hospital until such time as he gave reliable evidence of being cured. Instead of this he was sentenced on a charge of bigamy for some two years or so, and is probably ready to resume his nefarious practices in a free community at this writing. But our professor of law tells us that questions of social security cannot stand in the way of meeting the strict requirements of the law.

DR. L. P. O'DONNELL (Orangeburg, N. Y.).—I should like to ask Dr. Myerson whether he considers precipitating factor and cause as the same thing, because that is the point they play on in court. I have been in court

on cases of dementia præcox that, according to all testimony and from what the families and neighbors knew, were adjusting well until the time they had an accident when they developed dementia præcox. It seems to me that the trauma in such cases is a precipitating factor. When you go to court you will find any number of good psychiatrists who will disagree with you by stating that trauma is not a cause of dementia præcox. I should like to know how Dr. Myerson handles that situation.

DR. ABRAHAM MYERSON.—It may be of interest to know that a group, headed by myself, in studying the sterilization situation in the United States, studied the statistics of Massachusetts as a typical state, well developed in its psychiatric activities and facilities, as to the effect of the depression and in fact of other exigencies, upon the commitment rate. During the past five years the commitment rate in Massachusetts has definitely dropped insofar as manic-depression, dementia præcox, and psychoses of that kind are concerned. That is, in this period of emotional stress and strain there has not been a rise in the commitment rate. That goes well with his statement about the effect of the war, and, on the whole, places these psychoses within that rather vague, but still the only thing we have to deal with, the endogenous something or other in which the state of the individual is the most important matter.

As to Dr. Glueck's remarks, I am afraid that his is counsel of perfection, in large measure, *viz.*, that we first lift up the standard of ethics and then the law and the legal situation afterwards. In Massachusetts without any rise, so far as I know, in the actual ethical level of the psychiatric community, the passage of the Briggs Law did away with most of the conflict to the courts about criminal matters. I don't suppose that we became more virtuous but I do know we acted better. So with this particular situation, we can't enter the court with the idea that we are going to act as an elevating influence, and so we have to work within the framework of the law, which is that of conflict and battle. Two opposing sides meet, each presents his case before an umpire and referee and you have a medieval situation in which a champion appears for one side or the other. But within that framework we can still introduce modernity of opinion and attitude. One new technique would do away with a great deal of discrepancy, namely, the presentation of the same hypothetical questions to both sets of experts and then let the jury hear the answer and judge which sets of facts is correct.

It is perfectly true that the legal framework is in fact medieval, nevertheless, it has elasticity and there is within it the germs for a better status of affairs for psychiatric testimony.

What I wanted to do, so far as this paper is concerned, is to somehow or other, at some time or other, have this Association establish itself in favor of double hypothetical questions. As to passing on facts, that is against the whole experience of Anglo-Saxon law. The expert can only pass on a hypothesis. Only the judge, if there is a judge alone, and only the jury, if there is a jury, may pass on facts.

With regard to Dr. O'Donnell's question as to the relationship between a precipitating factor and a cause. Well, if you want to get into determinism, there isn't any cause and everything is a constellation of variables which operate upon any individual event within the universe of affairs, and nothing is caused by anything else, all is a continual ebb and flow. But, as I stated before, psychiatrists are practical men, living in a practical world, and dealing with practical concepts. A cause is something established as something without which the thing under consideration could not happen—the spirochæta pallida in the case of general paresis; the injury to the head and the epidural or the subdural hemorrhage which follows, the knife thrust which penetrates into the eye and severs the optic nerve—these are causes. In dementia præcox we have no cause in any established sense. We can only say that constitution is a predisposing configuration within the individual himself. Then an external event can at most only be a precipitating factor, and it can only be a possible or a probable precipitating factor. It seems to me that the magnitude of the external event and the time relationship of the agent and the psychosis must establish the relationship of the trauma or the external event in precipitating the psychosis.

To me, *hoc ergo propter hoc*, is the great danger. Coincidences occur at all times. Use the same clinical judgment that you would if the case were not medico-legal and no lawyer were there to put hypothetical questions to you. Ask yourself, do the statistics of psychiatry as you know them, and your experience substitute the belief that a slight cut with a tack may precipitate manic-depressive psychosis? If you had never seen such a case before, then you can say this is not the probable cause. The answer is simple, the logic is simple, but the results would be simply fine.

REMARKS CONCERNING THE DEVELOPMENT OF APPLIED PSYCHOPATHOLOGY.

By ERWIN STRANSKY, M. D.,

Professor of Psychiatry and Neurology, University of Vienna, Austria.

Applied psychopathology, in a larger sense, has been in existence for a long time. In some regards it has been practiced since ancient times, even if subconsciously. But surely it was Freud—and that may be granted by a non-partisan of his doctrine—who, with his school, has always shown the possibility of understanding psychological states and occurrences by psychopathological methods in many relations. The same may also be said by homologism about the related schools of Jung and Adler. But there are also others who have done research work, as for instance, Liepmann, Hughlings Jackson, and Ribot, and in America, last but not least Meyer, Kahn (formerly in Munich), and Schilder, who formerly worked in Vienna. All these, if in different senses, have pointed out, although not always directly, how much normal psychology has to learn from psychopathology. Among living clinicians in German-speaking countries, we may mention especially Bleuler and Kretschmer, to whom we owe much in this sphere.

All this being granted, it remains to say that—as far as I am able to see—applied psychology first found a formulation as a special program of work in 1918. In the *Allgemeine Zeitschrift für Psychiatrie*, Vol. 74, I developed a sort of outlook on this subject in general terms. I pointed out that it was necessary to comprehend and combine the different points of view resulting from the findings of psychopathological researches. It was in this connection that I coined the term “applied psychiatry” (*angewandte Psychiatrie*), in a more precise sense “applied psychopathology” as I prefer to say and to write since then. This term was immediately accepted by Morgenthaler of Berne who advanced the idea later by editing a journal, in collaboration with Jaspers (then replaced by Forel), H. W. Maier, Repond and myself. Among other remarkable papers, this contained the famous treatise of Rorschach on the “Interpretation of Forms” (*Formdeutversuch*).

In the year 1920 a new step was inaugurated by me in this direction. I founded, here in Vienna, the Association for Applied Psychopathology and Psychology, with special aid of Dattner and Roffenstein. This was dedicated to the idea of clarifying the methods by which the results of psychopathological research could be applied to research in other directions; we held scientific lectures and discussions¹ on the one hand, and on the other, we intended to create a sort of seminars and research collaborations between psychopathologists and psychologists, as well as between psychopathologists and research workers in other fields. It was J. Roffenstein who, in contact with me, first tried to realize the ideal of collaboration in seminars. But his early death, caused by a tragic street car disaster, delayed the further development of this undertaking. Soon after, I gave the presidency of the association into the hands of M. Pappenheim, under whose leadership we turned to other tasks. The most important event of this period was the meeting of the first international congress of applied psychopathology and psychology in 1930 at Vienna. This was a most interesting scientific gathering and its impression will remain in the memory of everyone who participated, especially those actively engaged.² It was then that the value of our ideas which had been matured by criticism became apparent to a larger scientific public. In consequence, a permanent committee of Austrian, German Empire and Swiss research workers was formed, including psychopathologists, psychologists and others. As one of the results of the meeting, the committee was to arrange as soon as possible for the next congress. Although we were close to the realization of this aim, European circumstances have prevented it.

Since Pappenheim, whose merits have been mentioned, moved away from Vienna, the leadership of the association has returned

¹ So, for instance, we arranged the first great public discussion in Vienna between psychoanalysts and the school of clinicians, inaugurated by a discourse by R. Allers (edited by myself and Dattner, published by S. Karger, Berlin, 1922). We have also had other discussions, partially published in the *Zeitschrift für die gesamte Neurologie und Psychiatrie* and in the *Wiener Medizinische Wochenschrift*. These all concerned problems of general and applied psychology, religion, sociology, law, ethnological and race-psychological problems, etc.

² The report of this congress was published by S. Karger, Berlin, 1931, edited by H. Hartmann, M. Pappenheim and myself.

to my hands (1934). From this moment I repeated my former efforts to realize a discussion in seminars and to establish collaboration in research. In this, I was supported especially by Mrs. Auguste Flach, one of the most diligent members of the seminars, a pupil of Professor Bühler and also a resident member of the psychiatric clinic of Professor Pötzl. I was also aided by Dr. K. Th. Dussik, a young physician of this clinic who is very studious and talented. The *via regia* for the continuation of the embryonal plans of the late Roffenstein seems to be to knit a new and strong bond between psychopathologists and psychologists. It was a source of happiness for us that, particularly at this time, two important schools of research in Vienna, headed by two important leaders, in consequence of their special motives of research tended to find a stable contact between their schools, and therefore were disposed to give their hands upon the occasion offered by us and to use our association as a common platform to serve for the realization of this collaboration. One of these leaders is Otto Pötzl, the clinical successor of our great and famous master Wagner-Jauregg. Pötzl, with his interest especially in research in brain pathology, has always favored psychological methods. The other leader is Karl Bühler, the head of the Vienna school of psychology, who was always convinced of the necessity of contact with brain pathology and psychopathology, since his special interest, the psychology of language, gives a special disposition to such a contact. We thus succeeded in creating a stable seminar for the discussion and research collaboration between these two schools, under the auspices and through the administration of our association, which at the same time does not neglect its other activities. This collaboration has been existing and active for two years with remarkable success, and is managed with a ridiculously small amount of money. This makes a sort of surrogate for a public seminar, organized on a larger scale, whose realization in our poor Central Europe has been, of course, a Utopia. Such a seminar, in German-speaking countries as perhaps in foreign lands,³ appears to be unique. The subjects for discussion are determined upon at the beginning of each academic year by Professor Pötzl and Professor Bühler with the assistance of myself. Out of the soil of

³ I have been informed that a similar organization has been formed in America within the last few years, on a larger scale, with a public subsidy, but I am not in possession of positive facts; I mention it, in any case.

these collaborations and discussions have already grown a remarkable number of positive results.⁴ These were useful for us psychopathologists, but also thanks to the great number of demonstrations of clinical cases and anatomical preparations—for the psychologists as well: they found a vivid contact with the clinical material, which was quite a new thing for the greater part of them and of special importance for them.⁵

But of course we intend to extend this collaboration by the addition of research workers in strange fields; the most important of these till now, who made a comprehensive and splendidly illustrated report in our seminar, was Professor Oswald Menghin, the famous authority on prehistoric times, who is at present Rector Magnificus of the University of Vienna. He spoke about the art of paleolithic man, in connection with which Dr. Gottfried Engerth, assistant at our clinic, reported on productions of design and sculpture by patients with mental disease. One of the results gained by comparing these two reports was to show that the somewhat uncritical manner of comparing psychotic patients with archaic men as is very often done to-day is far from passing muster. There are many similarities but not quite complete homologies, Perhaps I may be allowed to mention in this connection a report made to the seminar by myself concerning the efficiency curve (*Leistungsgefälle*) in special tests on normal, psychopathic and psychotic subjects.⁶ Recently we have benefited by very important reports of Bühler and his pupils and of Pötzl and Hoff ("Zeitraffer-Phänomen") then published in the *Zeitschrift für die gesamte Neurologie und Psychiatrie*. We have also heard important papers by Pötzl and the zoologist Konrad Lorenz and by Hoff and the

⁴ These concern especially the subjects of aphasic, schizophrenic and other pathological disturbances of speech in comparison with the psychological researches on speech, especially those of Professor Bühler and his pupils. The discussions were augmented by personal reports and frequent remarks of the two leaders, Bühler and Pötzl and by those of the more important workers of these two schools (Kauders, Hoff, Stengel, Dussik, as well as Brunswick, Fränkel, Wolf, Sonneck, etc.; the first-mentioned—Kauders—is recently professor of psychiatry and neurology at the University of Graz).

⁵ See the current reports of the seminars in the *Wiener Medizinische Wochenschrift*, 1935. Two reports concerning the year 1934 have been already published.

⁶ Then published in the *Schweizerische Archiv für Neurologie und Psychiatrie*, 1935.

physiologist Fleischmann (concerning different problems of comparing instinct-psychology of men and animals.)

It is not my intention to repeat here what I have said on other occasions on the same subject.⁷ I may be allowed to repeat my conviction that such collaboration with psychopathology is very useful for *nearly all* practical sciences dealing with human activities. It is, of course, not deniable that psychopathology receives stimulation from all sides; but it is certain that it is able to repay this stimulation with compound interest. So, for instance, we have seen that psychopathological researches have greatly aided eugenics, which not only is an object of interest for physicians and hygienists, but also has become a part of political science. We see that these researches are growing beyond their original limits and are aiding all of the practical social sciences in the largest sense. In Germany, it is to be seen now, the merits of psychopathology have been appreciated. Consequently an important influence has been given to physicians and especially to psychopathologists in legislation which has been enacted, such as previously obtained in no other land in the world. The great value of this fact does not seem to be diminished by the criticism which it is necessary to apply to this or that detail of such legislation. In common and scientific fairness, it is the duty of the physician or psychiatrist to recognize this fact and to state that it marks an undeniable progress in the political and cultural history of mankind—even though one, as the writer of these lines, is separated by facts of an anthropological nature (and not only by these) from certain basic ideas now governing Germany's mentality. But fairness and objectivity are, and remain forever a special *point d'honneur* for the research worker and for the physician; these compel him to recognize legitimate merits in men and ideas, even though they inflict, in other matters, pain on himself in some relations. Intensive collaboration with psychopathology could, moreover, be very useful to other branches of study which give less direct occasion than it does for practical knowledge of the mind. Psychopathology could, in fact, be useful to all those sciences which are concerned with human beings and human relations, because no human relations exist even in the economic

⁷ See, for instance, the lines published by myself on the theme "Angewandte Psychopathologie" in the *Psychiatrische-neurologische Wochenschrift*, 1932, No. 16/17.

sphere which do not have a psychological basis, and partially psychopathological aspects. Psychology, however, without psychopathological knowledge is only a torso without its other members.⁸ The forensic sciences have been aware of this fact for some time, and have applied it. Morgenthauer has had the courage to point out directly that, in public affairs and even in political life, psychopathological knowledge and its application is exceedingly useful. Let us, for instance, not neglect to consider, among many other things, the psychology of the masses.

The collaboration existing for some time between psychopathology and the forensic sciences, especially criminology, has demonstrated a fact of prime importance. Whenever the workers in two fields of research meet to form a sort of *entente cordiale*, this generally culminates in a comparison between the end results in each field. The two fields are often by their natures different in regard to their origins as well as the objects of their research, and the cooperation proves much less advantageous when this *entente* is abused for an uncritical meddling concerning their methodologies. The motto must be "separate marching, but a united front." Each field of research must choose its characteristic (*arteigene*) methods and not those which are foreign to it (*artfremd*). The mutual stimulation while being kept as active as possible must be limited by an agreement for mutual benefit, especially as concerns the ends in view and choice of the questions discussed. The comparison and exchange of results then obtained enrich both fields of work. This is a matter which should be understood by doctors of philosophy as well as by doctors of medicine and psychiatrists when they intend to make contact with each other. We understood this, as an important lesson of our seminar in regard to the relations between psychology, psychopathology and the study of prehistoric times. As I pointed out, it is far from being an advantage for those

⁸ It would, of course, be a great mistake to conclude that *all* human relations between human minds are to be understood *schematically* by psychopathological points of view. This was the great nonsense brought about by the so-called pathography. It was in consequence of this that psychopathology with its buried gold had a bad reputation for a long time. Tiling, the ingenious precursor of Kretschmer, had been criticized, legitimately by Cl. Neisser, for he had—allegorically—regarded psychology to be a sort of appendix of psychopathology; such and similar misunderstandings must be avoided.

sciences dealing with human affairs when they neglect contact and collaboration with psychopathology. But it is equally bad if this very necessary collaboration *pour mieux se connaître* should make confusion, since, as a matter of *methodology*,⁹ the occasions when such mutual influence in *methodologics* is useful are, I would not say merely inconvenient, but relatively restricted. This presupposed one must state that psychopathology is a province of medicine which has the most extensive frontiers and relations with other medical fields. For instance, mental hygiene, which came to life in America, is, as Kauders has pointed out, nothing else but a sort of applied psychopathology. In addition, psychopathology is related to widely different branches of science, beginning with theoretical and practical psychology and including history, research in religion and the development of culture, jurisprudence and the study of public and private human relations in the widest sense. The noble rôle of applied psychopathology is that of a mediator between these different fields. Its results thus serve mankind in health as well as in disease.

In closing, may I express my gratitude to Daniel C. Dawes, M. D. Yale University, now attached to the Vienna Psychiatric Clinic, who kindly helped me with my English style, which, of course, is not quite fluent.

⁹ Compare the reports on the two meetings for synthesis in medicine at Marienbad, Dresden-Leipzig, 1933 and 1935, publ. Th. Steinkopff (arrangement by M. Sihle, edited by Th. Brugsch).

THE BODILY ORGANS AND PSYCHOPATHOLOGY.*

By SMITH ELY JELLIFFE, M. D.

I am assuming that this audience is somewhat familiar with at least the term psychoanalytic psychiatry and that the general outlines of its principles are not unknown to many of you. Hence I shall but very rapidly skim over some of the high spots of its developmental history before I plunge into the subterranean regions of unconscious dynamics and the resulting possibilities in aiding, abetting or producing what is familiar to all as certain types of organic disease.

To trace in detail the complete history of the search for the connections between man's feelings, and the reactions of his bodily organs would take us not only far afield, but would occupy not hours but weeks. That ancient collection of wisdom, the Bible, is filled with such material. Hence if only the merest fragments of this story are gathered it must be left to your own individual backgrounds to fill in the gaps.

Darwin's conception of evolution in its general application, offers the first step in the genetic ideas which have fashioned the psychological sciences which lead one into the psychoanalytic story. In short there is a history behind everything. That history has had a development which we would like to believe is orderly and not solely a matter of chance, although we know that the trial and error method is one of Nature's methods.

Disease—in the large—is not something that just happens; a visitation from an angry god. It has a nucleus of determinism about it, a more or less orderly progress and its coming to be is, we hope, capable of being unravelled or analysed and thus partly understood. Nature is full of compromises, of more or less stable adjusting equilibriums between conflicting forces, and everything that happens—all events—may be understood, and handled, with

* Read in part at the ninety-first annual meeting of The American Psychiatric Association, section on psychoanalysis, Washington, D. C., May 13-17, 1935.

that degree with which the various impinging stimuli, or causative factors become known.

Although Stephan Zweig essays to show in his delightful work on "Mental Healers" that Mesmer might really be named as the germinating individual of the psychical principle, it was with Charcot that clearer insight into the first of the psychoneurotic disorders, hysteria, was obtained. Hypnosis was, as you know, the technic then employed in its therapy, but of its understanding there was, through hypnosis, nothing. In fact hypnosis needed explaining. As you know, Freud studied with Charcot. In the fall of 1885—he was then 29 years of age—he obtained a scholarship and went to Paris and to Charcot, at the Salpêtrière. He had already done meritorious work, even as a youngster of but 21 years of age (1877), in Meynert's laboratory, in his studies on the "Origin of the Posterior Nerve Roots in *Ammocoetes*"; on the "Spinal Ganglion and Spinal Cord of *Petromyzon*" (1878); on the "Structure and Origin of Nerve Fibers in the Crab" (1882) and other anatomical and also clinical studies, two of which latter, one on "Infantile Birth Palsies" (1891) and another on "Aphasia" (1891), are still, in certain points, in the lead of present day conceptions in that the evolutionary conceptions of Hughlings Jackson were either appreciated by Freud or were independently developed. He really discovered the local anesthetic action of cocaine on the eye. He was well on his way toward a laboratory career in neuroanatomy and physiology and the hopes for academic honors when he was awakened from this dream by the recognition of the antisemitic feeling in Vienna's academic circles.

He then went into practice, but even as a youth of 23, he was friendly with Joseph Breuer. From this combination came the celebrated "abreaction" idea, the talking out, chimney sweeping notion, which later became elaborated in the free association method which led deeper into a study of the psychological mechanisms of the dream. You all know of the early ideas of the significance of infantile sexual traumata in the development of Freud's ideas and in his History of the Psychoanalytic Movement can be found the essential details of the story up to 1914. From this time onward there has been an almost torrential mass of new research material which no one could condense within a short time.

A definition of psychoanalysis, such as "analysis of the psyche," is only a short-hand translation of a word—an etymology—and means little. A description of psychoanalysis on the other hand would explain the workings of a process and this means a great deal. For practical purposes, psychoanalysis is a process, or method, of studying or learning about fundamental reasons for human behavior in terms of inward drives or urges in relation to the realities of the external and internal worlds. It is an empirical experimental method of investigation which can be used, not always with complete satisfaction, to learn why and how human beings operate as totals, or wholes; why they have preferences and prejudices, why they write stories, paint pictures, believe in lucky days, or numbers, knock on wood, make mistakes, get into difficulties of money, of happiness, of health, in short, a method that can be used with varying degrees of success to learn the actual manner in which mankind's mental systems operate and bring about behavior, no matter of what kind, internal as metabolic, or external as in everyday life.

It may be used thus not only as an empirical method of study, but it also has great possibilities, by properly trained individuals, of therapeutic application in the treatment of numerous types of bodily ills. All illnesses are of the "body" in the strict sense of the word. Furthermore psychoanalysis stands for a group of dynamic psychological conceptions or ideas. It is not a Weltanschauung, or philosophy. It is essentially an inductive procedure.

In all three aspects psychoanalysis stands preëminently as the work of Sigmund Freud of Vienna. Any other type of method of study, or mode of therapy, or body of dynamic psychological principles is *not* psychoanalysis. If medicine were to adopt the methods of the "patent" or "copyright" office, all other near to, or allied with, spurious imitations or distortions of Freud's studies would be infringements, imitations, fraudulent or mendacious copies. Many of them are parasitic growths, denying the parent from which they spring and which alone gives them any real validity, even if couched in different words.

The application of psychoanalysis shows, in part, that when men and women attempt to state their beliefs about behavior situations, they almost invariably tend to fool themselves. In slang terms

they "pass the buck." In psychoanalytic terms they rationalize. They like to make the explanations seem reasonable. Man, including woman, universally indulges in autistic or phantasy thinking, *i. e.*, wish-fulfilling explanations for almost everything he does. Thus man's fancied beliefs that he always knows why he does this or that or how things come to be turn out to be largely fictional.

An ancient psalmist * said "in his haste all men are liars." While all the world recognizes that lying is a not unusual form for explanation of behavior to take, psychoanalysis prefers to use the term *rationalization* instead, meaning thereby that what is manifest or conscious in man's reason is not all that is there. What is in consciousness is in reality being influenced by something under pressure deeper down in the individual. This is spoken of as "unconscious," relative or absolute. Rationalization therefore is chiefly a compromise between what may be a real "unconscious" reason—*repressed*—and what may pass with the particular group that calls for explanation of the behavior in question. Consciousness therefore functions chiefly as an adaptive mechanism; especially when automatic wisdom is wanting.

The principle that a dynamic process of repression of unconscious urgings or drives is constantly operating in human behavior, in order to meet with real or fancied attitudes on the part of the physical or social surroundings is essential in psychoanalysis.

Psychoanalytic psychology, called by Freud metapsychology, assumes that all human behavior operates through mental systems which may be divided roughly into three parts, termed by him, the Id, the Ego and the Super Ego. In this scheme the Id is that part of man's mental systems which has accumulated experience with the world since life began on the globe and which is present in every part of the human body. It is a billion years old and is magnificently wise. For me it is what the old Homeric Greeks meant by "Soul." Here I can refer you to Dr. Cannon's important works on the "Wisdom of the Body," (1932), and his "Bodily Changes in Pain, Hunger, Fear and Rage," (II Ed. 1929). Much of this "wisdom of the body" is absolutely unconscious. Such are the automatic activities that go on in the internal organs, kidney, liver, blood, spleen, thyroid, etc., and of the inner behavior

* Psa. 116. 11.

patterns of which almost nothing is known in consciousness. This "Id" or "It," at least its oldest parts, can be said to occupy the depths of the human being. It is the core of his personality, and is that part of himself which he shares with all other forms of life, plant as well as animal. Some biologists would use the word "*instinct*" to give a short-hand term for such drives or urges that are universal to all living matter.

Out of this primitive mass of experience, and chiefly apparent in man, a specialized part, the "Ego" arose. The chief function of this part of the mental systems is to test reality. It is spoken of as chiefly conscious and has developed words or signs or symbols, of color, sound, etc. It also is an agent in suppression and in repression. By it is not meant the popular term Ego, the self, the Me, Mine, "Mego." This latter will here be spoken of as the Personality.

An automobile metaphor may be used to roughly illustrate these systems. In such a figure of speech the *Id* is the gasoline and the engine. The *Ego* roughly corresponds to the gas feed and the steering gear operated by a conscious driver. Man's engine, his *Id*, is always running, night and day, partly idling as to outside work but very busy in internal work. In the daytime the steering gear must always be in action; at night there is comparative rest for the Ego, but the mental systems still go on operating, as frequently glimpsed in the dream.

When psychoanalysts began to study individuals with certain kinds of mild or severe sick behavior, rationalized as nervous, and also when they began to try to understand hypnosis, and the dream process, another important bit of the functional mental machinery called for explicit description. Wise people had known of it for centuries. In religion it was called "conscience." In Freud's scheme this is the Super-Ego, or Ideal Ego. It operates between the conscious perceptive system, the "Ego," and the unconscious, the "Id" and is in dynamic relations with both. In the automobile metaphor already used one can picture it roughly though not as fixedly as the hand-brake and the foot-brake. It has been built up from precept and example, from the parents and the nursery and then from the family to society. Some of it is very old but of this phyletic wisdom, as seen in reflex action for example, there

is little time for discussion, although later it may turn out to be of great significance in what is called the retreat or "flight into illness."

Psychoanalytic psychiatry sets itself the problem of analyzing the respective activities in these three parts of the mental systems for explanations or understanding of any bit of social or bodily activity, *i. e.*, activity of the entire person on the environment or of the organ adaptations within the body.

The initial or primary organic or animal drives come through the *Id*. By some they are termed the primary instincts, often called self-preservation and race propagation, or what the poet Schiller called "Hunger" and "Love."

Common sense has learned and teaches that all of these factors in the mental systems have had to grow up. In infancy both the Ego and Super Ego are very weak and unorganized and the *Id* is all powerful. The child is a "little animal." It lives in a phantasy world with its primitive pleasures. It has tantrums, or sulks, or cries when not satisfied, or laughs and gurgles when pleased. It mostly sleeps. Through pain and pleasure the Ego system begins to learn about reality and then through precept and example builds up its adaptation to the world. All this is common sense. But stated in psychoanalytic terminology, the primitive titanic *Id*, neither good nor bad, but just the running engine, is guided (suppressed) by conscious experience, the Ego, and still further controlled (repressed) by the Ideal Ego as an accessory brake to that degree that behavior is made conformable to the mores, in each particular situation, *i. e.*, ideally becomes adaptive, successful and pleasure giving. In its highest form of social adjustment this adaptive process earns the term "*sublimation*." The forces of the *Id* then become socially creative and attain survival value, both individually, racially, and sociologically.

So much for the rough outline of the mental systems, the how and why, the *behavior patterns*, without any details of the "what," the parts, *i. e.*, the organs, *i. e.*, the *anatomical patterns*, of the body.

Millions and millions of parts are involved, but as already stated they have had a billion years to learn their lessons; otherwise man would not be here, the fittest of all animals thus far to survive. This "survival of the fittest" is chiefly due to the generally evol-

ing type of one organ of the body, *i. e.*, the nervous system, and one particular part of it, the central switchboard, *i. e.*, the central nervous system where there are some several billion central stations with dial systems of which the American Telephone and Telegraph system is as simple a sample as the alphabet is to all the books in the world.

To speak about the parts would involve much of what the chemist, the biologist, and the anatomist have learned. Much of this knowledge is necessary for the psychiatrist in order that he should get at problems of non-adaptive conduct in bodily organ functioning. Common sense knows that the major *but not the only* drive in the human machine comes through the race propagation instinct. All other statements to the contrary are false. One may emphatically state that neither Freud nor any one understanding his principles ever has said that sex is the only instinct in life. In accordance with this drive however man comes into being. The human being came to its present preëminent place in answer to its imperious urge. The hunger or "domination" instinct is insignificant in its tension compared to it. It is a supreme bit of rationalization to say that self-preservation is the first law of nature. To satisfy stomach hunger alone is a comparatively easy task, and man does not live by bread alone.

When by the psychoanalytic method the unconscious layers in the *Id* are analyzed it finds the old-old patterns enormously complicated. The chemist has analyzed crude oil and finds it contains hundreds of thousands of different substances of which gasoline is only a mixture of a few. In much the same manner the sex instinct has been found on analysis to be composed of an enormous number of elements, which have evolved from amœba to man and are recapitulated in him in the developmental phases from infancy to manhood.

The briefest summary of these periods of involutionary recapitulation are the intrauterine *archaic*, the infantile *organ-erotic*, or auto-erotic, the adolescent self-love or *narcissistic* and the adult heterosexual stages, *social* which in their highest sublimation forms evolve on through mating, nest building to a vast variety of creative productive activities.

The psychoanalytic method has tended to show that the earliest infantile patterns can best be understood by referring them to a

certain content and form. To this the term "Œdipus Complex" has been applied, although pre-Œdipus phases are also there. In general the "Œdipus complex" means that since male must find female in properly adaptive cravings in order that life shall go on, the infantile models show that the mother-father images are the respective objects for the boy-girl children. This infantile model as such is usually subject to the work of repression and partial sublimation by 3-5 years of age. Those parts of it which

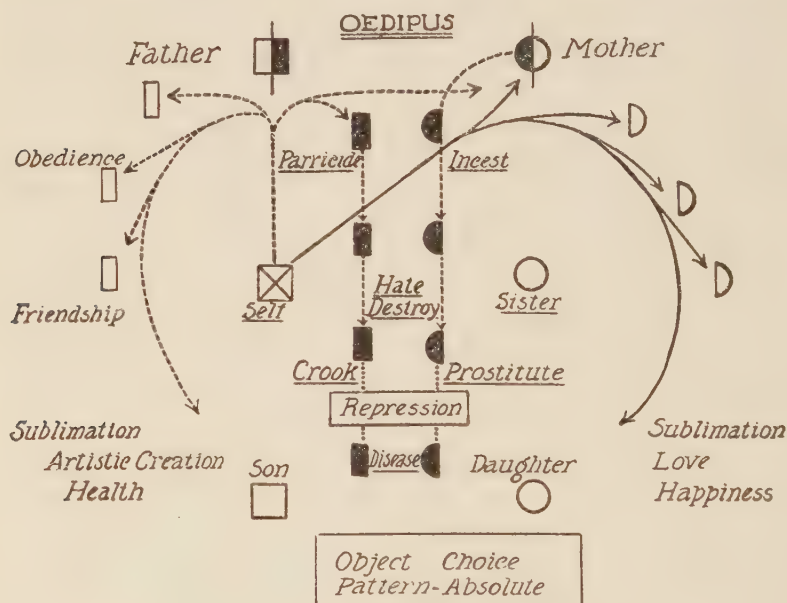


FIG. 1.

linger behind in development (fixations) show other patterns out of which the "sense of guilt" and the "need for punishment" (castration anxiety) develops. Fixations of infantile models (identifications) which require extra amounts of energy to repress by both the developing Ego and Super Ego bring about definite *character traits* in different individuals. This is but a brief thumbnail sketch of the innumerable possibilities that take place in human mental activities. Out of these character traits the various kinds of human behavior develop and become more or less fixed or habitual for good or evil.

A new auto which runs along without any trouble is conceived of as O. K. and neither driver nor riders are aware of it, but when something happens, then the hunt for trouble begins. It may be within the car, it may be from the outside.

The psychiatrist then is a trained trouble hunter who has developed certain methods of research to enable him to try to locate and to remedy certain human behavior difficulties due both to difficulties within and without the individual. He should be a trained engineer in human behavior problems and only through such a training is he competent to use the methods of psychiatry. Inasmuch as he must work with the human machine he should be one who knows such a machine, therefore primarily one with a biological and medical training. Since the most important part of the machine is that which organizes or integrates the entire machine, *i. e.*, the nervous system, he should be ideally a trained psychologist, neurologist and psychiatrist and finally since man is inseparable from his human environment, from opinions, ideals, customs, etc., the psychoanalytic psychiatrist must needs make special studies of social customs, religions, literature, and the arts. The public should know that any Atlantic City boardwalk advertiser or any newspaper advertiser or writer of popular catch pennies who calls himself a psychoanalyst is a quack.

The full details of the method cannot be entered into at this time. One should read Freud's own works, most of which are translated, rather than works about Freud's works, many if not most of which are extremely stupid and misleading.

Psychoanalysis utilizes such unconscious material as is available. Some of this material may be found in the creative activities of the individual, his poems, his compositions, his productions, his daily work. The *royal road to the unconscious*, however, is the dream life. Here free associations of dream material are most often employed in psychoanalysis. With the technical details of dream analysis we cannot stop at this time. They are highly complicated and only patient and analyst *together* in actual contact can analyse dreams. Dream analysis by mail is "fake." Other methods are illusory and much rubbish is written and talked about dream analysis.

Psychoanalysis is a specific methodology used to ascertain many fundamental difficulties, both of external behavior (conduct) and

internal behavior (bodily disease). As a therapeutic procedure it can remedy many of such difficulties. Only well-trained individuals, however, should be trusted to apply it and those licensed by the state to practise medicine. Psychotherapy is a most difficult and most important branch of medicine.

Let us turn now to certain conceptions of the machine, the human being, which is to be studied or influenced by the method.

The thought which orients the present discussion is that the entire organism carries out its reactions through patterns, or purposes, or drives, or if one will, more simply, wishes. Such patterns of action are mostly fairly fixed, in part the entelechies of Aristotle, but certain amounts of adaptive freedom of control enable certain organisms to operate more advantageously than others.

All living organisms from the lowest of plants (*Protococcus*) to the highest of animals (*Homo*) may be regarded as transformers of energy. In higher forms, as in man, for example, this energy is captured by means of receptors (the senses, some 20 or more of which are anatomically known, some of which are still of humoral or primitive undifferentiated structures). This energy is transformed through structuralized bits of experience (anatomical, chemical patterns), called the organs. These activities are all loosely coordinated at humoral levels and more highly integrated by the nervous system. The energy is finally delivered through two main channels. In general, one may be spoken of as Metabolism, functioning for the automatic upkeep of the human machine, the other, also in general, as Conduct or Behavior. The chief end and aim of this conduct or behavior is the *continuance of life*.

In lower forms of life, bacteria, certain protozoa, and in certain higher forms, as in many plants, the action pattern may be carried on by a nonsexual process. The bacteria and protozoa propagate chiefly by fission or non-sexual sporulation. Higher plants like potatoes repeat themselves by tubers, or others by rhizomes and other fission forms. This type of process prevents evolution and new forms. Hence for all higher forms sexual patterns have evolved. Everyday biological science says that these sexual patterns require male and female objects, and male and female parts through and by which the living form can be continued.

The transformed energy that pursues this creative goal, either within the body as seen in growth or repair, in mating, or in family formation, in works of art or in invention, has been called *libido* by Freud. Many superficial or illy informed writers use the word *libido* as if it meant genital activity, or eroticism or similar limited meaning. Thus genital activities, as with prostitutes, professional or other, are not the work of Eros (*libido*), but of the Death Instinct (*Thanatos*). They are destructive not constructive.

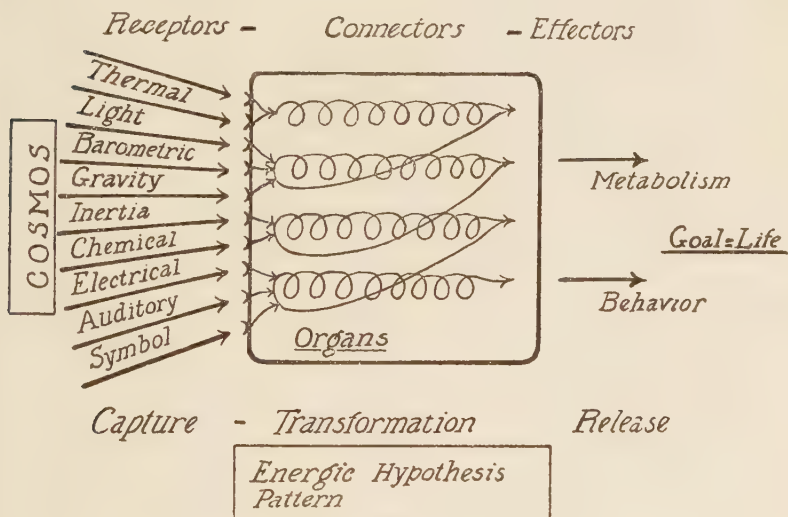


FIG. 2.

Psychoanalysis is only secondarily interested in epistemological problems of what is reality? As an empirical, experimental science it makes no claims as a philosophy or a *Weltanschauung*. It studies chiefly *unconscious* processes.

Expressed in a simple mathematical metaphor we can say that Conscious and Unconscious represent the numerator and denominator respectively of a fraction, in which the numerator is very small, from minute to minute, the denominator very large, a billion years. From this the proportion can be formulated. *As from minute to minute is to a billion years, so is our conscious knowl-*

edge of what we are doing to the unconscious forces that make it happen. It is because of this great disproportion of the two aspects of the mental apparatus that the doctrine of "Fate" was so widely held by the ancients.

From this proportional metaphorical statement then, from the psychoanalytic viewpoint, if one would know what relationship the mental bears to disease processes in general, such must be sought for in unconscious processes rather than in conscious rationalizations. There follows as a corollary the formula that says *"Any deviation from Object or Aim (in the Unconscious), is capable of causing disorder or disaster in the delivery of the energy of the human being either at the level of metabolism or at the level of conduct, or both.*

At the conduct level, such disorders or disasters are of social significance chiefly and are dealt with chiefly by legal agencies as antisocial, criminal or delinquent conduct, or by medicine as psychoses and certain psychoneuroses. At the metabolism level, organ disturbances result. These are of more personal significance and are termed organic disease, acute, subacute or chronic, as the case may be. Certain of these will be dealt with in our discussion at this time.

Accident must be eliminated at once. A large number of accidents are met with in medicine, but admitting this, it is equally important to state that in some sense much chronic disease is unconsciously wished for. It is the work of the Death Instinct. Some of the reasons for this belief which psychoanalysis has discovered, I shall hope to point out to you.

The science of medicine from time immemorial has spoken of diathesis or tendency. Hippocrates is full of this. In recent years pathological science speaks of it as Constitution. Certain kinds of persons, as judged by bodily form (Kretschmer, Pende, Draper, *et al.*), are thought to be more apt to have certain kinds of diseases. This has been hinted at for centuries. The sum total of accumulated transmitted factors, chiefly recorded in structural patterns are spoken of as the hereditary constitution of the individual. Psychoanalysis regards heredity in the light of accumulated experience. It accepts it as such and to be studied by other than its methodology. The Id contains all this heredity and/or constitutional capacities. Whether all of it is capable of being brought to

symbolic form in an open question. Freud regards Jung's ideas on this problem as yet purely speculative and as yet not capable of scientific proof. It may be sound intuition but is it inductive science?

The reactive capacities of the individual to the environment, internal as well as external, conscious as well as unconscious, in their entirety may be regarded as the "Personality." For more details one can consult the enormous literature so diligently collected by Roback in his *Bibliography of Personality*, 1929.

I would call your specific attention to what may be called the *psychological component* in organic disease processes. Other components you are aware of. (Nearly all disease may be better understood if the dynamics of the psychological component be perceived). In order to understand this psychological component it is of value to bear in mind the mechanisms of the mental apparatus as already sketched. You do not need to be told that "Life is a conflict." The survival of the fittest is a conception that needs no emphasis here. The individual is surrounded by forces with more or less fixed laws and more particularly by other individuals with their own personal goals. "Reality" is the term used in popular language as well as in psychoanalysis as a summary of these general situations. Every individual's nine months intrauterine life is a recapitulation of a billion years. This you know as the v. Baer-Haeckel law. Man is a time-binding animal. Or speaking in psychoanalytic terms, the Unconscious is timeless, the past and present and almost the future are there. All this phyletic experience is there in the developing embryo and a great deal is happening before birth, which is of great significance for the problems of internal medicine of which we would speak. This is recognized by psychoanalysis, but psychoanalysis as yet is skeptical as to the ability of its *method* to get at it. What is popularly known as *pre-natal influences* are not sniffed at, but it is not yet certain that such can be demonstrated inductively through the empirical experimental methods of psychoanalysis. Psychoanalysis is a rigidly objective experimental science. It is *empirical realism* if one wishes a term of this order. It cares less about counting however than valuing.

The individual begins at birth its struggle for oxygen, for food, for elimination of catabolic products. The forces of the "Id," are

all important. All takes place hedonistically or in pursuance of the *pleasure principle*.

All of this has been elaborated before, but it seems desirable to emphasize the mechanisms of *repression*, of *regression* and of *conversion* if one would understand the dynamic economics of the psychological component that may participate in the bringing about of irreversible tissue changes in an organ that are called organic disease of that organ.

Life's obstacles, conflicts, which range from innumerable petty annoyances to major catastrophes, surround us at every moment. They must be adapted to. This adaptation takes place with ease or with difficulty depending upon the factors of Heredity and/or Constitution which are the more fixed features of our organization and the Personality or the more variable capacities which have developed from childhood.

The Id urges the pleasure of fulfillment of the creative pattern along individual lines. It is met however by the repressing forces of the ego (Reason) and of the Super Ego (Authority) and is forced to compromise at adaptive levels. If in the language of the energy transformations the libido surmounts the difficulties and the individual gains gratification at socialized levels, there is harmony of organic action and well being results. When only a part of the libido gratification is accomplished, and repression is, in a sense over successful, chiefly through a tyrannical Super Ego, sublimation becomes ineffectual, then the repressed portion of the libido pushes back to earlier stages of adaptation. The energy charge of the libido regresses.

What happens to the repressed libido and the repressing forces? In a crude sense it backfires, or stalls. Here is where internal medicine becomes interested. If the repressing forces are of sufficient dynamic potential to push back the libido to those stages in the individual's development when isolated organs were limited autocracies, as they were in infancy when each organ sought its own gratification, independent of the others, then the fat is in the fire.

As physicians, you do not need to be reminded how vigorously the infant will scream, as a single outlet, to signify innumerable discomforts. It is only later when by appropriate gesture or ver-

balization the specific source of displeasure may be indicated with the expectation of relief, *i. e.*, return to the equilibrium of pleasure.

In academic psychology, body and mind have occupied parallel pigeon holes for centuries. Down to the days of Socrates the Homeric Greeks rarely separated them. Plato spilled the beans when he "disembodied the soul," and to this day the theologians have capitalized the confusion and some have fattened on the fears of the superstitious. One of the most important of the conflicts between the Ego and Super Ego which operates as a large factor in the mechanism of the need for punishment thus gets its great push through the sense of guilt. The working through of the threat—"Vengeance is mine, saith the Lord"—into the bodily structures is the scarlet thread that runs through the story of the psychological component in organic disease.

The mechanisms of conversion, of substitution and of projection as means whereby repressed and regressive libido may be more adequately managed are all operative in internal medicine problems. Psychoanalysis has learned much of conversions, as seen in the non-malignant conversions, *i. e.*, reversible processes, of Conversion Hysteria, that imitate nearly all bodily disease. The so-called Compulsion Neuroses, which in general are more malignant maladaptations than the conversions, utilize *substitution* mechanisms more particularly. In many psychotic manifestations, the projection device is manifest. Here the libido is projected from the self to the outside world, in an effort to *save* the bodily organs.

Only a small beginning has been made in tracing the more malignant and persistent conversions back into the organerotic level which can be an element in the production of chronic disease of various organs. It is premature to say *how much* of the pathological disturbance in an organ's functioning can be attributed to the economic maladjustment of repressed and regressive libido operating at the organ level. It can be abundantly proven however that some of the energy is operating to aid the disturbance. Further research with the method will clarify our formulations. In many acute attacks of eczema, of arthritis, of exophthalmic goiter, of asthma, and many other situations, an antecedent "nervous" or "emotional" situation has been a conco-

mitant finding. Psychoanalysis has for its main object the more adequate analysis of those states so loosely and superficially called *nervous* or *emotional*. Psychoanalysis is not content with such omnibus words which mean everything and nothing. When such "nervous" or "emotional" situations are resolved into their component elements by the psychoanalytic method the dynamics of the various libido mechanisms become as clear as the respective mechanisms in an automobile with its exploding gas (Id), its transmission (connectors), and its steering gear (Ego), brakes (Super Ego), (all crude analogies), etc.

Here, as elsewhere in other sciences, the theoretical interpretative formulations are ahead of the ability to apply the principles concretely in all cases. By analogy much is known of earthquakes in geophysics, but no one yet through such knowledge has shooed off an earthquake. Physical-chemistry tells of the enormous quantities of energy locked up in a shovelful of sand, but as yet no one has been able to boil an egg with a pebble in spite of the large quantities of heat known to be locked up in the same pebble. Thus if one is to apply to clinical problems of internal medicine the principles, here outlined, while not so far off from application as are the hopes of controlling earthquakes, nor cooking with pebbles, they are nearer to specific applicability. The amount of time required for educating, reeducating and remaking the Personality is so great as to seriously hamper the worker. For the present only a beginning, although an important one, has been made. Patients, in their unconscious, resist the wish to be cured if they must relinquish some of their infantile pleasure patterns.

The understanding of psychoneuroses is paving the way for an interpretation of the dynamic principles involved in organic distortions which very frequently begin silently or subtly as neurotic disturbances. This has been known for centuries. While in the neurotic stage of maladjustment (organ neuroses) the somatic processes are still reversible, hysterical conversions for instance, which behind a great multiplicity of forms involve the skin, mucous membrane, stomach (so-called dyspepsias), bladder, bowel (constipations), etc. After a certain number of years of such faulty adaptations (classically at about 40) the processes become irreversible. The leaning tower of Pisa has leaned too far and then

organic disease has begun. It may be too late. *Behavior pattern has eaten its way into anatomical pattern and will not be recalled.**

Even a brief sketch of some of these innumerable situations could occupy many hours instead of the limited time at my disposal. Perhaps it will be profitable to touch on certain so-called chronic disorders. Chronic is largely another word for not-understood.

Since the skin has been bathed in its ancestral sea-water like fluid the billion time-bound years spent in the womb, dermatology offers an opening wedge. Here eczema and psoriasis stand out as two intriguing situations, still pointing a finger of scorn at current dermatological understanding. That in the beginnings one should be preeminently wet and on flexor surfaces, the other dry and chiefly on extensor surfaces, has meant little to present day dermatology; not even to allergic dermatology which entirely overlooks the vast series of problems involved in chemical cellular memories. Psychoanalysis, utilizing symbols as tools for thinking, queries in terms of flexor surface the caressing tendencies of the skin and in extensor surfaces the rebuffing or hostile activities. On the flexor side, there is taking, grasping, possessing. On the extensor side, refusing, rejecting, hitting, hurting. In these two disorders, the skin libido of such afflicted individuals activates ambivalent (bi-polar) efforts at gratifications, either through auto-punition (masochistic) or hostility (sadistic) repressed, regressive satisfactions at narcissistic and organ erotic levels. The repulsive acnes of many young adolescents are found to be the expression of their sado-masochistic organization. They punish their faces to scourge their souls, or they display their hostility to a kind but falsely interpreted (as hostile) world.

A very early patient with a universal psoriasis comes to my mind. Efforts at sublimation of repressed criminal tendencies through the study of law, then the practise of criminal law for relief, then additions of economic social aid for related social distorted patterns all were of little avail. Twenty-five years ago I recall I asked him, as a masochistic dream-expressed drive became

* Special attention may be directed here to a highly valuable and thorough bibliographic survey of the literature devoted to psychosomatic interrelationships by Dr. H. Flanders Dunbar. *Emotions and Bodily Changes*. Columbia Univ. Press, 1935.

certain, "Why do you wish to get in jail?" (The psoriasis was the equivalent of his intra-uterine jail). He finally achieved this unconscious wish. It is a long story.

Were I to stop and but briefly indicate to you what psychoanalytic psychiatry even now has to say about smell and its memories, its identifications with the body odors of self and childhood—surrounding objects and the resulting libidinal fixations, their repressions, and later regressive possibilities, I could a tale unfold about the common cold, sinus disease, epileptic seizures, and hosts of compulsive erotic reactions, which might well rival the weirdest tales patterned after the memorable classic of Livingston's "In Darkest Africa." Also were I to try to show the as yet imperfectly oriented anatomical patterns from olfactory receptors to the corpora mamillaria, tuber cinerea and the hypothalamic nuclei, I might get into psychoendocrine behavior-pattern correlations which could occupy many hours of interesting fact and profitable speculation.

For the lungs tuberculosis stands out as a striking unsolved problem. The tubercle bacillus is only a part, even if a necessary one in the story of tuberculosis. We all harbor the bacillus. Only a few die of it. The soil that *permits* the growth of the tubercle bacillus is as of much, if not of more importance. Here psychoanalytic psychiatry has something, as yet but feebly, to say. It finds that in many instances the flight into a tuberculous disease is a way to satisfy the death instinct, either at very infantile levels, back to mother, or at more adult levels. In a manner of speaking, "You'll be sorry when I am gone," says the unconscious, unwittingly of course. Sometimes it is revealed as a form of "revenge" because of infantile interpretations of fancied favors to sister or brother or to other specially loved or favored ones. There are innumerable gradations of the "possession complex" of the Freudian formulation, that the tuberculous reveal. Man does not live to breathe alone. He must use his respiratory apparatus for more sublimated activities. It is not surprising therefore that the universally distributed tubercle bacillus should find an easy home in an organ which is failing to come up to its complete adult socialized capacity as in instrument of social as well as respiratory value. Psychoanalytic psychiatry can claim but a beginning in the study of the unconscious of the conflicts in the personality of those who

conquer the tubercle bacillus or of those whose flight into an illness causes the work of the death instinct to prevail.

Immediately after the establishment of breathing at birth, the child begins to suck. Now from the mouth to the anus the digestive tract begins to function physiologically as well as psychologically. Conflicts between pleasure attaining and pain avoiding begin. In a sense as a child sucks at his mother's breast so will he treat the world as an object of attainment in life. It is no great wonder that the stomach should reflect conflict throughout life. It is the organ par excellence of retreat in the face of frustration. Early tendencies of the nursing infant will foreshadow many things that are to come in stomach and intestinal diseases. Constipation, diarrheas, dyspepsia, gastric, duodenal ulcers, appendicitis, diverticulitis, ileus, gallstones, maybe even carcinoma, are conditioned by personality conflicts displaced to the guts. These "diseases" are not necessarily due to the faulty distribution of libido, entirely or in part, *i. e.*, preëminently psychological, but your everyday horse-sense teaches you that many of these difficulties cannot be completely understood and, therefore, intelligently treated, without a proper evaluation of *what part* and *how much* unconscious conflict is operating. To assume that a peptic or duodenal ulcer patient should be psychoanalyzed instead of being operated upon, especially after 40, is hooey. The gastroenterologist however *must* get an insight into psychological factors in order to be a good gastroenterologist. I deem it absolutely essential to emphasize that so far as the carcinoma problem is concerned the facts are still too deeply buried to permit even speculative suggestions. It should be said however that ignoring the psychoanalytic method as a part of the program of research for the ultimate understanding of carcinomatous and other malignant growths is stupid.

Chronic medicine has written a large chapter on disorders of the muscles, tendons and joints, variously called arthritis. Of late these have been more or less separated into two generally defined tendencies in which (1) joints show proliferative reactions to infections, or (2) degenerative reactions to unknown factors. The former occur in younger individuals chiefly and are now more or less officially called "rheumatoid arthritis." The latter occur in older persons and receive the portmanteau term "osteoarthritis."

For the infectious types, psychoanalysis asks here the same kind of question that it asks for tuberculosis. What of the soil, the personality, that permits, shall one say only 2 per cent or less of the population to have such joint infections even though everybody's tonsils, teeth, sinuses, intestines, etc., harbor the general and specific varieties of infectious organisms so diligently searched for by the bacteriologist, and rightly so.

Psychoanalysis has thus far only a slight look in on the unconscious pulling, hauling, muscular tensions of greed and grasping, the aggressive, hostile striking, kicking, beating tensions which are of significance in the degenerative osteoarthritis. These deep psychological conflicts are capable of involving the metabolism of the joints. They help to bring about the changes that lock up the joints in fruitless arthritic bondage when run over years of faulty adjustment. Those unsuppressed hostile aggressive impulses which in the anti-social individual forces society to lock him up in jail or hospital, in the repressed but unsublimated individual turn upon himself and through *self* punishment bring about a different kind of jail—the wheel chair. It is little wonder that the ancient theologians should have said, “Judgment is mine, I shall repay, saith the Lord.”

The analysed cases of various osteoarthritis are but meagre in psychoanalytic literature as yet. There is good reason to believe that working with massage, hydrotherapy, physiotherapy, much can be done by enlightened psychotherapy with such cases.

An interesting picture comes to mind in the person of a man of 50 whom I saw but on a few occasions professionally but have known 40 more years. He was all tied up with a widespread osteoarthritis. The x-ray pictures were typical.

If one were gathering statistics to show heredity it might be said that his mother had arthritic joints after 60. An older sister began to develop a widespread osteoarthritis after 50 and at 70 was badly crippled.

He was the youngest child in a family of five, of which three grew to maturity. He had an intense rivalry with an older brother. There was some evidence of the older brother's early aggression. At his birth the older brother was looked after by the 10 year old sister, this left the mother to him.

He was more gifted in many ways than the older brother but was impatient whereas the brother was more plodding. The father was a professional man. The older son studied for a profession but the younger wanted to get ahead; took a commercial course, went into business and married early.

"He got ahead of his brother" he once told the wife of the brother. He was successful but prodigal. There were children, divorce, remarriage and widowed he lived with two daughters, one of whom had married and had one child.

This daughter was trying to get a divorce from her husband and this mix-up played a large part in the development of the osteoarthritis from the present point of view.

There was a strong father-daughter fixation and my patient, for some two or three years before I saw him, was all tied up in the emotional and economic conflict between these hostile elements. He hated the son-in-law with a virulence just this side of murder. As he described the long drawn out legal contests, prolonged beyond any possible understanding, his knotted fingers would curl into tearing tools of torture of what he would like to do to the whole situation, lawyers, judges, son-in-law, his backers, etc. "To rip out their guts" would be the mildest form of action that he would like to perform.

He was constantly thwarted, beaten, and pressed and it was in the midst of the situation that I saw him. He was not lacking in insight into psychological possibilities and after but a few talks began to mend his ways. He perceived that his violent rages got him nowhere except nearer to making himself a cripple and some few months later he showed very marked improvement although he was far from well. Economically he was in difficulties as he had spent a small fortune trying to aid the daughter in her fight and were it not for a sublime faith in his future possibilities, borne of almost delusional self confidence, he would probably be a crippled dependent. He had encouraged an ever optimistic personality to heights of ultimate success and thus the grasping at future possibilities took the place of his sadistic, hostile muscle-joint aims with a marked improvement in their functional activity.

Here unconscious material was not available as he lived in a midwestern city, could not afford to be investigated, nor could I promise him anything more than an interesting if not profitable journey into the functioning of the unconscious. But even with the little I could say to him I was gratified to learn that it apparently had borne much more fruit than the teeth pulling, uterine cutting and other operations that had been carried out extensively in the case of his mother and sister, neither of whom had been helped the slightest bit of these radical procedures. I have the records extending now through 40 years.

This is one of but many whose x-rays and histories I could show.

Many disorders of the heart are known to be of "nervous" origin. Such is the popular, and correct tradition. "Nervous," like "emotion" are omnibus words. "Nervous" to psychoanalysis means many things in which the mental apparatus is involved. They are interpretable in accordance with the Oedipus complex pattern. Conversions, substitutions, projections and other mecha-

nisms are operating here also. For many obstinate heart conditions psychoanalysis has proven of great service. This does not mean that rest, diet, quinidine, digitalis, strophanthine, etc., should be thrown out of the window. I should be a fool to stand here and even suggest such a thing. But even with these remedies as useful regulators of cardiac function, psychotherapy is still available even in severe cardiac lesions.

Psychoanalytic investigation and therapy finds a highly important field in the study of cardiovascular hypertension states. Here marked episodic or permanent variations in blood pressure, which often bring about arteriosclerosis, may be influenced. In many instances such vascular states are of psychological genesis which may be a primary factor which leads to cerebral hemorrhage. Straining in rage is much worse than straining at stool. Sydenham has told us of gout connected with rage and another celebrated physician of near antiquity has said that his life was in the hands of the first rogue that enraged him, through "angina," in fact he died in such a rage attack.

The "passions," using this word in its old sense of hatred, rage, jealousy, envy and related emotional activities has been empirically known for centuries to produce bodily disturbance. The ancient injunction, "Let not the sun go down upon thy wrath," is but one of the ancient wisecracks about this situation.

The only method at present known to me that is capable of measuring with any degree of satisfaction the component parts of these "passions" and of showing just how these faultily guided affective states can produce vascular and bodily disease, especially through blood pressure alterations, etc., is through psychoanalysis. Beneath the "silken glove" of "nice people" are often hidden violent sadistic impulses. The façade of urbanity, may be but a disguise for intensely strong investments (cathexis) of hostile impulses. Many reformers and prohibitors are filled with such "consciously righteous" but "unconsciously murderous" impulses.

Just as any man in a regiment can get out of step, so any organ of the body is able to get out of harmony with the body as a whole. The control of the endocrine glands by the mental apparatus offers many practical problems for psychopathology. Many of these endocrine organs are very intimately related to and function as

primitive nervous tissues. It is a highly significant fact that when one considers the body as a machine that operates through chemical energies, that certain endocrine organs show predilections for specific chemical substances. Iodine, potassium, sodium, phosphorus, sulphur, calcium each have their special reservoirs in such bits of structuralized experience. The many interrelations make them objects of special interest.

The endocrine organ disturbance at present best known in internal medicine to be related to psychological situations is that of the thyroid. In response to mental situations, sometimes of a very subtle and hidden nature, an increased activity with accompanying problems of much complexity and significance is brought about. Mild or even dangerous hyperthyroid states are widely recognized as accompaniments of or as directly caused by conflicts between the Ego and the Id. The Romans knew of some interrelationship between the thyroid and the uterus, you may recall they noted the swelling of the thyroid of young girls at the menstrual period and literary allusions to its measurements by blades of grass are recorded, but only in recent years has this been shown to be a close anatomical one. Psychoanalytic investigation has frequently shown some very definite conflict mechanisms which utilize the thyroid as a compensating organ activity. When this fails the thyroid activity goes on to such extremes as to jeopardize the life of the individual. Jelliffe and Lewis originally showed some very clear cases of such relationships. Many hyperthyroid states developed during the War, partly because of psychological components, partly because of altered adaptive capacity in other organs, from fatigue, etc. (adrenals, pituitary). A host of thyroid disturbances remain to be carefully investigated by the psychoanalytic method. Acute hyperthyroid states with high basal metabolic rates, it must be emphasized may need immediate surgical intervention to save life.

"The medicine of the future," will occupy itself more and more with more accurate evaluations of the effects upon the human body of aggressive hostile impulses and with methods of bringing them to consciousness and thereby saving mankind from many crippling and devastating chronic diseases. Psychoanalytic psychiatry is aware that popular belief, and theological formulations have been actively proclaiming such inherent interrelationships ever since

human records have been made, whether in the form of myths, religious beliefs, rituals and observances, the epigrams of Rochefaucauld, or the wisecracks of the mummers, and vaudevillians to Will Rogers, but psychoanalysis is the first scientific entering wedge into bringing the dynamics of such human and social factors into the clear light of conscious evaluation in terms compatible with those of the physical sciences.

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PSYCHIC TRAUMA IN THE ETIOLOGY OF GRAVES' DISEASE.

A SURVEY OF 5000 CASE HISTORIES.

By ISRAEL BRAM, M. D., PHILADELPHIA.

Sooner or later the clinician who is brought in contact with many sufferers from exophthalmic goiter is forced to the realization that the psychic factor permeates every phase of the disease. It is significant in the heritage of the individual; it is observed in the personality and behavior pattern. Almost invariably it exists as the apparent exciting factor in the form of psychic traumata commonly preceding the occurrence of the outspoken syndrome. Finally, the psychic factor is a vital consideration in therapy.

THE APPARENT PREDISPOSING FACTOR—THE "GRAVES' CONSTITUTION."

In 1923, under the caption "The Prevention of Exophthalmic Goiter" I called attention to the observation that subjects of Graves' disease have had a pre-Graves' disease status and the "earmarks of susceptibility" that differentiate them from humanity at large.¹ Shortly thereafter Warthin,² Simpson,³ Moschowitz,⁴ and Lorand and Moschowitz⁵ published noteworthy contributions on the pre-Graves' disease status which they termed the "Graves' constitution."

In the above mentioned contribution I called attention to the common observation that (a) hereditary influences play an important part in susceptibility, as evidenced by the frequency of multiplicity of cases in the same family; (b) that this hereditary predisposition may become intensified by acquired factors through errors in the conduct of life or through maladaptation to environments; and (c) that in the vast majority of cases of Graves' disease there was superimposed upon predisposition an exciting factor which appeared to instigate the onset of the syndrome.

The history of subjects of Graves' disease reveals that they were nervous and delicate during infancy and that childhood was

characterized by nervousness and emotionalism. Alertness of mind at the expense of physical vitality is frequently described by parents as characterizing school life, though most often these youngsters present a floridity of the skin, indicating apparent good health.

EARMARKS OF SUSCEPTIBILITY TO GRAVES' DISEASE.

It appears that the earmarks characterizing a young adult possessed of susceptibility to Graves' disease (the Graves' constitution) are (a) heightened cerebration, (b) autonomic and emotional instability, (c) excitable heart, (d) vasomotor ataxia, (e) brilliant, sparkling eyes and (f) an unduly palpable thyroid gland. A lowered threshold of emotional reaction is particularly characteristic.

Those susceptible to exophthalmic goiter are an interesting type, giving to the world many artists, writers, musicians, painters, educators and leaders of men. Herr Stressemann, great leader of post-war Germany, was already afflicted with the malady when in the height of his career, but too busy with affairs of state to undergo proper treatment, died in harness. The average candidate for exophthalmic goiter is an idealist, relatively incapable of fighting his way through the vicissitudes of life without scars.

PSYCHIC TRAUMATA.

Susceptibility alone is usually an unconscious quality, largely objective, typifying but not incapacitating the individual. It appears that in the absence of an exciting cause, predisposition may not tangibly mar the individual's efficiency and well-being throughout a normal span of existence. Doubtless there are thousands of persons susceptible to exophthalmic goiter who are going through life in an apparently normal manner, oblivious to possibilities which would likely follow the occurrence of an exciting cause.

The term psychic trauma, based on the fear instinct, is applicable to situations in which, with or without physical injury, the mind has received an impact or shock from which it does not readily recover its former poise. The shock may result from a cause acutely, subacutely or chronically operative.

Just as some persons present undue sensitivity to drugs, foods, pollens and temperature, so do those predisposed to Graves' disease

present specific reactions of one or another degree to psychic and environmental irritants. They appear incapable of satisfactory adjustment to adversity which sooner or later may befall every human being. In a situation in which the instinct of self-preservation is called upon to decide between fight and flight, the sensitive individual is singled out of the crowd to become the subject of exophthalmic goiter. On the firing line in battle, during a conflagration, an earthquake, a shipwreck or a train accident, 49 out of 50 persons may emerge from the harrowing experience quickly to recoil to usual physical and mental health. One of them, however, quickly or gradually develops symptoms merging into the typical picture of "frozen fright" characterizing exophthalmic goiter. The eyes stare, the heart palpitates, there is subjective and objective trembling, the skin remains moist, insomnia becomes complete, emotionalism dominates mental existence, there is rapid loss of weight and the basal metabolism rises. This form of psychic trauma (imminent danger to life and limb) is but one type of emotional insult elicited in the history of these patients.

VARIETIES OF PSYCHIC TRAUMA.

Varieties or shades of psychic trauma are as numerous as the colors of the rainbow. One person may be immune to one type, yet quite susceptible to another form of psychic insult. While a large number of patients attribute their plight to an automobile or other vehicular accident, others may experience two or more such mishaps with impunity, but rather develop exophthalmic goiter during or shortly after a period of intense worry due to business failure. Again, despite the fact that quite a few other incidents classifiable as psychic traumata had been experienced without tangible harm, a percentage of these persons trace the development of symptoms from the time of the acute emotionalism resulting from a disappointment in love, a chronically criticizing in-law, a badly spoiled child, perhaps a bit of "neighborly" vicious gossip, the death of a newborn infant, intense apprehension over school examinations or over a business venture. Singly or in combination, these and other conceivable emotion-provoking events appear to serve as the torch instigating the syndrome in susceptible persons. We may meet an individual who is apparently calm, composed and

collected, capable of meeting ordinary emotion-arousing situations with commendable equanimity, yet whose psyche is almost irreparably assailed by the sudden death of a loved one or the loss of worldly goods. Perhaps some day psychologists will find a way to measure individual emotional susceptibilities in much the same way as we now perform tests for allergy or for thyroid activity. This would probably assist in the solution of the problem of the prevention of exophthalmic goiter.

MULTIPLE PSYCHIC TRAUMATA.

While in many cases the first psychic trauma is regarded by the patient as the origin of symptoms of exophthalmic goiter, in others, two or more such provocative experiences are held responsible in the history. Occasionally three psychic traumata may be experienced with apparent impunity, yet a fourth or fifth of another character appears to break down the remaining resistance to Graves' syndrome, constituting the "straw which broke the camel's back." For instance, a young married woman went through her first difficult childbirth fairly successfully. Another pregnancy, several months later, imperiled her life and terminated in a so-called "nervous breakdown" necessitating a stay at a rest-cure sanatorium. When shortly after delivery she became pregnant again, the intense apprehension resulted in a frankly outspoken attack of exophthalmic goiter. Again, a young man having after much difficulty settled himself in a promising business, later found it slipping from him, and in course of time became bankrupt and was obliged to secure a position of an inferior nature to keep body and soul together. This blow he faced bravely and with fortitude. But the loss of a parent shortly afterward led to persistent nervousness for which he finally sought medical aid. The doctor relieved him of the major part of his complaints, then suggested the removal of his infected tonsils as a safeguard against relapse of symptoms. Within two weeks after this operation the patient began to feel unusually nervous and again consulted his physician, who now made a diagnosis of exophthalmic goiter. Apparently the psychic trauma incident to tonsillectomy was the "last straw."

In the order of their importance, we might conveniently classify and exemplify the varieties of psychic traumata preceding Graves' diseases as follows:

I. ACCIDENTS, NARROW ESCAPES, ETC.

Shock and terror incident to accidents and narrow escapes, and harrowing situations with imminent danger to self and others apparently served as the exciting cause in 35 per cent of exophthalmic goiter cases in our series of 5000 case histories. The following are typical examples:

CASE 1.—Mr. N. E., 22, was struck by a trolley car. Though not seriously injured physically, he developed extreme emotional symptoms. A month later the diagnosis of exophthalmic goiter was made.

CASE 2.—Mrs. E. M., 35, fell under a wagon and injured her fingers. Six months later she underwent a tonsillectomy which made her extremely nervous, and when she consulted her physician several weeks thereafter she was told that she was suffering with exophthalmic goiter.

CASE 3.—Mrs. S. T., 52, dates her attack of exophthalmic goiter to two years ago, following a fall down a flight of stairs. Lack of harmony in her home was given as a supplementary cause.

CASE 4.—Mrs. E. D., 52, dates her symptoms of exophthalmic goiter from the time of an automobile accident a year ago.

CASE 5.—Mr. C. S., 38, developed severe Graves' disease shortly after two serious automobile accidents which occurred a few months apart.

CASE 6.—Mr. E. Mc., 32, developed a very severe form of exophthalmic goiter immediately after the following incident: while a government inspector in a munitions factory during the world war, he saw a freight train jump the track into a warehouse full of shells; a terrific explosion followed, and though he was unhurt, the picture of frozen terror of exophthalmic goiter was evident when he was picked up after a period of unconsciousness.

CASE 7.—Mrs. I. S., 40, dates her malady from the time her child fell out of a second story window; this accident resulted in the development in her child of epilepsy.

CASE 8.—Mrs. A. S., 28, dates her malady to shortly after the time when a horse ran at her child on the pavement; although the youngster was unhurt, the mother became hysterical and soon developed typical Graves' disease.

CASE 9.—Miss R. B., 25, developed the syndrome shortly after the following incidents: on looking out of the window of her home she saw the gasoline tank of a car (with a man in it) on fire; the next day she saw her sister's baby drink something she believed to be poison; the following week she fell down a flight of stairs.

CASE 10.—Mrs. R. B., 27, was told that her child had infantile paralysis, and despite the fact that this diagnosis was later found to be erroneous, Graves' syndrome had begun and continued its course.

CASE 11.—Mrs. E. R., 30, presented a severe form of Graves' disease of 5 years' duration following this incident: she called to see a friend who was an inmate of a mental hospital, and while there this friend had an epileptic seizure. Badly frightened, she tried to make her exit when she was attacked by another inmate who blocked her way out.

CASE 12.—Mr. J. O., 32, drove his automobile in front of a train and jumped for his life.

CASE 13.—A man of 26 was very badly frightened 6 years ago when informed that he was suffering from tuberculosis. He had been nervous since. Four years ago he was struck by a trolley car. This accentuated his nervous manifestations. Two years ago he participated in an automobile accident, and a few weeks thereafter his physician stated that he was suffering with exophthalmic goiter. When the patient was referred to us he not only presented a chronic form of Graves' disease, but also a complicating manic depressive psychosis with suicidal tendencies.

CASE 14.—A housewife of 52 developed very severe Graves' disease 4 years before, following a fright as the result of a practical April fool's joke.

CASE 15.—A housewife of 20 developed the disease almost immediately after the severe fright of seeing her baby fall off her bed.

CASE 16.—A man of 42 developed the syndrome 20 years ago when he was badly frightened by a dream in which he saw a man with an axe standing over his mother's bed. Incidentally, the unusual chronicity of the syndrome was occasioned by periods of partial remission through radiation of the thyroid years before.

CASE 17.—A woman of 26 was terrified by a fire next door. The following day she was badly frightened by prohibition officers who raided her home by mistake.

CASE 18.—A man of 32 was struck in the face by a golf ball.

CASE 19.—A girl of 23 had a narrow escape from drowning.

CASE 20.—A physician of 31 struck his head forcibly against an iron beam.

CASE 21.—A housewife of 38 was badly frightened by a negro breaking into her house one night.

CASE 22.—A woman of 24 developed the syndrome shortly after being badly frightened by a man who followed her at night as she was walking across an empty lot.

CASE 23.—A woman of 30 was awakened from a deep sleep to be informed that her next door neighbor had died.

CASE 24.—A housewife of 38 was a passenger on a railroad train passing through the Hudson Tunnel bound for New York. The train was suddenly derailed and she felt sure that the passengers would "drown like rats," as she put it. When she was finally rescued and taken to a hospital it was revealed that though she was physically unhurt, she was suffering with evidences of acute exophthalmic goiter.

2. SHOCK FOLLOWING DEATH OF A LOVED ONE.

Shock and grief over the loss of one or more loved ones preceded the onset of Graves' disease in approximately 32 per cent of cases of our series. To exemplify:

CASE 25.—Mrs. E. K., 48, was intensely grieved over the death of her two children.

CASE 26.—Mr. S. G., 30, was shocked by two deaths in his family within two weeks.

CASE 27.—Mrs. H. S., 47, received news of the sudden death of her mother and sister in Europe.

CASE 28.—Mrs. A. B., 43, saw her sister's baby burn to death.

CASE 29.—Mrs. S. S., 45, was shocked by the death of both parents and the fatal accident of a brother-in-law, all of which occurred within a year.

CASE 30.—Mrs. M. G., 58, could not recoil from intense grief over the death of her husband.

CASE 31.—Mrs. H. H., 37, grieved intensely over the death of her twin brother from influenza.

CASE 32.—Mrs. I. K., 39, developed a severe form of Graves' disease shortly after the loss of two brothers within several months; the first, a twin brother, died after thyroidectomy for exophthalmic goiter; the second was found murdered.

CASE 33.—Miss R. K., 26, became ill shortly after the suicide of an uncle to whom she was very much attached.

CASE 34.—Mr. A. M., 43, developed typical Graves' disease shortly after the sudden death of his wife.

CASE 35.—Mrs. H. L., 47, developed the disease shortly after the death of her husband during an operation.

CASE 36.—Mrs. M. A., 26, grieved deeply over the death of her mother shortly before her marriage. Five months later she lost her father.

3. GRAVES' DISEASE FOLLOWING MULTIPLE PSYCHIC TRAUMATA.

Repeated psychic traumata are often given the medical historian as factors responsible for an attack of Graves' disease. We have already mentioned a few such histories above. Which incident is apparently the most provocative is often difficult to establish, but it may be that the totality of effects constituted the exciting cause in most such cases. Following the second or the third shock, the remaining resistance is apparently lowered to the breaking point. The following are examples:

CASE 37.—Mr. M. S., 45, traced his malady to a motor cycle accident some years before, and to severe business reverses and a narrow escape in an automobile accident more recently.

CASE 38.—Mrs. V. M., 45, developed severe exophthalmic goiter after three psychic traumata, namely, being endangered by a gasoline explosion, followed within several months by the suicide of her husband, and shortly thereafter by an automobile accident.

CASE 39.—Mrs. S. C., 25, developed moderate Graves' disease after the following incidents: an automobile accident; another a few months later in which her right breast was injured, and the death of her father.

CASE 40.—Mr. A. S., 29, developed Graves' disease after the following series of happenings: intense business worries, an aeroplane trip (during which he was badly frightened) and an attack of influenza, all of which occurred within a year.

CASE 41.—Miss P. P., 26, presented exophthalmic goiter of a few years' duration, beginning shortly after being badly frightened by a dog, and the ordeal of tonsillectomy, both incidents occurring within a period of two months.

CASE 42.—Mr. H. H., 37, developed Graves' syndrome shortly after the ordeal of being obliged to carry a corpse down stairs; a few days later his brother died of influenza.

4. WORRY OVER REAL OR IMAGINARY ILLNESS.

Worry over real or imaginary illness of self or loved ones is another form of psychic trauma stated by patients to be the starting point of Graves' syndrome. To exemplify:

CASE 43.—Mrs. G. B., 47, dated her syndrome from the time of a serious automobile accident due to which her husband was at death's door for a long time.

CASE 44.—Mrs. L. P., 60, developed a severe form of the disease shortly after an emergency appendectomy undergone by her husband.

CASE 45.—Mrs. A. C., 52, developed the disease when it was revealed that her mother was suffering from cancer; she brooded over the possibility that she, too, might be suffering from cancer.

CASE 46.—Mrs. C. B., 56, developed incipient Graves' disease shortly after discovering what she thought were evidences of tuberculosis in her only child. Disillusionment by medical experts did not alter the course of the mother's syndrome.

CASE 47.—Mrs. G. G., 39, presented typical exophthalmic goiter of 5 years' duration, beginning shortly after the discovery that her child was an epileptic.

CASE 48.—Mrs. P. F., 26, developed the syndrome 5 years ago when her child contracted infantile paralysis.

CASE 49.—Mrs. B. B., 30, developed the disease 9 years ago when her husband became very ill. He recovered, then relapsed within a few months.

CASE 50.—Mr. C. F., 39, developed the malady while intensely worried over his wife's serious illness and operation 4 years before.

CASE 51.—Miss C. R., 21, was intensely worried over her father's illness which necessitated her leaving college.

CASE 52.—Mrs. B. F., 36, gave birth to a baby with club feet; her intense worry was followed by Graves' symptoms within 2 months after delivery.

CASE 53.—Mrs. C. B., 24, was intensely shocked over the accidental, though not serious, poisoning of her child.

CASE 54.—Mr. C. C., 28, developed Graves' disease after being badly frightened when told that he had cancer of the lip; the diagnosis later revealed a benign lesion, but the Graves' syndrome became progressively worse.

5. PSYCHOSEXUAL MALADJUSTMENTS.

Due to the fact that consciously or unconsciously the woman's life is largely dominated by her sexual existence, psychosexual maladjustments * in the female appear to play a greater rôle in the pathogenesis of Graves' disease than in the male. The following are examples:

CASE 55.—Mr. A. B., 54, traced his malady to the time of his serious marital disagreements and divorce.

CASE 56.—Mrs. R. B., 36, developed the syndromes shortly after a series of violent quarrels with her husband.

CASE 57.—Mrs. R. F., 51, developed the syndrome 10 years ago, after a prolonged period of misunderstanding with her husband.

CASE 58.—Miss M. M., 21, had an intense disappointment in a love affair.

CASE 59.—Miss E. S., 19, developed the disease after a violent quarrel with her parents over her fiancé.

CASE 60.—Miss S. M., 18, had an unfortunate love affair.

CASE 61.—Mrs. C. J., 22, experienced a few embarrassing escapades when out with other men.

CASE 62.—Mrs. C. W., 50, developed a serious form of Graves' disease after her discovery that her husband was having a love affair with a nurse she had engaged several months before to look after her daughter.

CASE 63.—Miss M. M., 24, dated her Graves' symptoms from the time of breaking off her engagement 2 years before.

CASE 64.—Mrs. F. A., 40, a widow, presented a similar history.

CASE 65.—Mrs. F., 31, became ill with Graves' symptoms after a series of quarrels with her mother-in-law.

CASE 66.—Mrs. A. D., 28, dated her symptoms from the time of her marriage 5 years before, admitting the existence of sexual incompatibility.

6. PSYCHIC TRAUMA INCIDENT TO OPERATIONS.

Another form of acute psychic trauma may be described as incident to surgical operations, usually minor, such as tonsillectomy, nasal operations, uterine curettage and the like. Such histories preceding the onset of Graves' disease constitute approximately 7 per cent of our series. A patient may assume an air of bravado immediately before tonsil removal or tooth extraction, and yet become badly frightened during the operation. This is no argu-

* Marital entanglements and maladjustments, sexual incompatibility, disappointments in love and other conceivable situations relating to the sexual and human relations of the near-marital and marital status are often difficult to elicit and to unravel.

ment against removal of infectious foci in general. Since exophthalmic goiter following such procedures usually occurs in those operated upon under local anesthesia, it is suggested that the candidate for tonsillectomy and other minor surgical procedures be studied pre-operatively with a view to determining whether it would not be best to administer a general rather than a local anesthetic. The following are typical examples of this form of psychic trauma:

CASE 67.—Mrs. L. C., 26, developed the disease within a few weeks after tonsillectomy.

CASE 68.—Mr. M. K., 32, had undergone tonsillectomy and appendectomy 6 months before the development of severe Graves' syndrome.

CASE 69.—Miss P. P., 26, had undergone tonsillectomy a few weeks before the development of Graves' syndrome.

CASE 70.—Mrs. S. S., 30, developed a severe form of exophthalmic goiter following tonsillectomy performed a year before, cholecystectomy and appendectomy 8 months before and 2 curettage operations in the same year.

CASE 71.—Mr. M. M., 29, underwent appendectomy. Symptoms of Graves' disease appeared immediately after operation.

CASE 72.—Mr. H. D., 32, presented a similar history.

CASE 73.—Mrs. W. D., 23, underwent appendectomy 10 months prior to her baby's birth. Frank symptoms of exophthalmic goiter were noted after childbirth.

CASE 74.—Mrs. F. L., 47, developed the disease following a hysterectomy.

CASE 75.—Mrs. C. F., 24, underwent a curettage without a general anesthetic, and developed Graves' disease a few weeks thereafter.

CASE 76.—Mrs. R. MacD., 43, traced her symptoms to shortly after the fear and pain experienced on the extraction of molar teeth.

7. INTENSE WORRY OVER FINANCIAL REVERSES AND DISTRESS.

The business depression has exhibited in the human make-up weaknesses which otherwise would have been unrevealed. Sudden deprivation of the accustomed standard of living and sense of security is an insult to pride and a shock to the nervous system. Since the Wall Street spectacle of 1929 scores of sufferers from exophthalmic goiter whose plight can be ascribed to financial losses have come our way. Here are a few examples:

CASE 77.—A housewife of 43 developed Graves' disease several weeks after her husband lost all their savings in the stock market crash.

CASE 78.—A man of 38 was a wealthy real estate operator prior to 1929. The marked depreciation in real estate values resulted in huge losses in his

holdings. Finally in 1930 he became bankrupt. A month later he was a subject of typical exophthalmic goiter.

CASE 79.—A man of 40, heretofore highly respected socially and financially, found himself accused of dishonesty in business dealings and in course of time was sued by some of his creditors and abandoned by his friends. A few weeks later he was bed-ridden with a critical form of exophthalmic goiter.

CASE 80.—A well-to-do widow of 55 retired from the millinery business in the spring of 1929 to partake of the benefit to be derived from the hectic rise in security values. She believed the stock market crash to be a temporary reaction and supported her holdings by advancing all the money she could lay her hands on. Subsequent further demands by her brokers for more margin found her depleted. She was sold out, became bankrupt and obliged to seek employment. The resulting nervousness, at first diagnosed as nervous breakdown, was soon found to be a severe attack of exophthalmic goiter.

CASE 81.—A woman of 24 developed exophthalmic goiter several weeks after her husband's suicide due to losses in the stock market crash.

CASE 82.—A widow was sending her daughter of 18 through college. The mother lost all her money in the stock market crash. Following a month of grieving over the discontinuance of her studies in preparation for a career, the daughter developed exophthalmic goiter.

CASE 83.—A woman of 35 developed exophthalmic goiter several weeks after a mortgage foreclosure on her home.

CASE 84.—A man of 52, unemployed for a year, had used up his life's savings to keep his wife and family in relative comfort, and now was obliged to resort to charitable assistance. This was soon followed by the development of severe exophthalmic goiter.

CASE 85.—A school teacher of 60 lost her life's savings in the stock market crash. The resulting nervousness deprived her of her capacity for teaching and she became indebted to her relatives. Within a few months her worries culminated in a very severe form of exophthalmic goiter.

CASE 86.—A man of 50 who did not gamble on the stock market but had put away considerable money for a rainy day, found himself penniless when the bank to which his money was entrusted failed. He soon developed extreme nervousness which resulted in exophthalmic goiter.

CASE 87.—A woman of 45 developed exophthalmic goiter shortly after the following experiences: the loss of her husband's investments in the stock market, his bankruptcy in business, failure of the bank in which his cash reserves were deposited, his inability to find work, the presence in the family of a child with infantile paralysis, and increasing indebtedness to relatives.

CASE 88.—A woman of 58 had resources consisting of an apartment house in which she had an equity of approximately \$8,000 and upon which there existed \$80,000 in mortgages. In the autumn of 1929, because of reduced rentals, she found herself incapable of keeping the property in spick and span condition. Thereupon most of her tenants moved away. She soon found herself without income and without capacity to pay her obligations

on the property. Foreclosure proceedings were started, and when the house was sold by the sheriff, she was left without means of support. An attack of so-called nervous indigestion was followed by what was diagnosed as nervous breakdown, and in the course of a few months the patient was a typical subject of severe exophthalmic goiter.

8. PSYCHIC TRAUMA INCIDENT TO PREGNANCY AND CHILDBIRTH.

It appears that parturition, associated as it is with apprehension for self and offspring as well as fear of the ordeal of labor, is more likely to serve as a provocative psychic trauma than pregnancy itself. In our series of patients 4 per cent developed exophthalmic goiter shortly after delivery. The following are examples:

CASE 89.—Mrs. I. W., 42, presented the syndrome since the birth of her baby 14 months before.

CASE 90.—Mrs. B. B., 30, developed symptoms of Graves' disease after the sixth month of pregnancy.

CASE 91.—Mrs. L. R., 32, developed Graves' syndrome after a miscarriage.

CASE 92.—Mrs. C. V., 40, stated that the Graves' syndrome began after an instrumental delivery 18 months before.

CASE 93.—Mrs. D. M., 24, stated that her symptoms began after delivery of her child by Cæsarian section.

CASE 94.—Mrs. C. M., 48, thought she was pregnant, became intensely chagrined because of her age and developed exophthalmic goiter.

CASE 95.—Mrs. J. P., 29, developed Graves' disease following delivery of her baby, which she had tried to dispose of by abortives shortly after conception.

CASE 96.—Mrs. M. M., 34, developed Graves' disease after the fourth consecutive annual delivery; this baby, at least, was not wanted.

CASE 97.—Mrs. F. M., 40, had a narrow escape from septicemia following a criminal abortion.

CASE 98.—Mrs. A. G., 24, developed Graves' disease after undergoing a second Cæsarian section.

9. PSYCHIC TRAUMA OF WORRY INCIDENT TO WORK OR STUDY.

Especially in recent years intensive educational and occupational maladaptation has apparently been an exciting factor in the development of Graves' disease. Many claim to have had a "nervous breakdown" weeks, months and occasionally a year or two preceding the onset of the existing syndrome. The patient's description of the "nervous breakdown" usually corresponds either to early or to atypical Graves' disease. In many cases the apprehen-

sion, sensations of trembling, palpitation, restless sleep and under-nourishment were temporarily ameliorated, and the individual was capable of resuming some or all of the customary duties. A relapse soon followed which culminated in frankly outspoken Graves' disease. The following cases exemplify this form of psychic trauma:

CASE 99.—Mrs. J. J. M., 31, school teacher, was intensely worried over unmanageable classes.

CASE 100.—Miss E. A., 25, was constantly "worried sick" over her office work which was of difficult and most exacting character.

CASE 101.—Mrs. H. A., 28, suffered from overwork incident to retaining a difficult position and attempting to take care of her household and sick husband simultaneously.

CASE 102.—Miss D. H., 28, school teacher, was overworked and over-conscientious, habitually taking much work home with her, teaching night school and summer school and depriving herself of adequate sleep.

CASE 103.—Mr. L. I., 27, worked very hard through college. This he thought reduced his resistance, but he attributed the direct cause of his attack of exophthalmic goiter to his 7 months' service in the navy during the World War.

CASE 104.—Miss M. C., 29, developed a severe form of the disease following a prolonged period of intensive overwork at college.

CASE 105.—Mr. J. F., 40, developed the syndrome during the intensive worry and overwork incident to his duties as milk inspector during a widespread "milk strike" between farmers and city concerns.

CASE 106.—Mrs. K. C., 32, deprived herself of much sleep during a prolonged period of worry and overwork attempting to maintain ownership of three hat shops simultaneously.

10. GRAVES' DISEASE APPARENTLY FOLLOWING GENERAL OR FOCAL INFECTION.

Such general infections as influenza, pneumonia, tuberculosis and syphilis were given as the probable starting point of Graves' disease in approximately 2 per cent of our series. Possibly the more plausible exciting cause, though not elicited, was either deliberately unrevealed by the patient or forgotten. The same might be said of focal infections in teeth, tonsils, sinuses, Fallopian tubes and elsewhere, which also occurred as apparent exciting causes in about 2 per cent of our histories. Though on general sound principles we must remove diseased tonsils in all goiter patients, it is felt that these and other infectious foci play but contributory etio-

logical rôles in exophthalmic goiter. It is conceivable that infections tend either to increase the predisposition to, or aggravate the syndrome of Graves' disease, thus playing an indirect rôle.* The following cases are examples of infections apparently serving as contributory or exciting causes of Graves' disease:

CASE 107.—Miss D. C., 14, developed the syndrome while recuperating from an attack of acute follicular tonsillitis and influenza.

CASE 108.—Mr. L. W., 37, dated his symptoms from an attack of tonsillitis.

CASE 109.—Mrs. A. L., 27, developed Graves' disease during convalescence from pneumonia.

CASE 110.—Mrs. H. T., 28, dated her attack of exophthalmic goiter from the time of an attack of acute inflammatory rheumatism.

CASE 111.—Miss L. W., 17, developed Graves' syndrome within a few weeks after an attack of influenza.

CASE 112.—Miss M. B., 25, developed a mild form of Graves' disease during convalescence from influenza.

CASE 113.—Mr. C. S., 28, presented a similar history.

CASE 114.—Mr. S. A., 33, presented Graves' disease shortly after recovery from an attack of pleurisy with effusion.

CASE 115.—Dr. S. T., 30, a dentist, developed the syndrome within a few weeks after convalescence from a severe dental infection.

CASE 116.—Miss A. A., 16, presented symptoms of the disease while recuperating from an attack of quinsy.

II. EFFECT ON SOME PREDISPOSED INDIVIDUALS OF DRUGGING BY THYROID SUBSTANCE OR IODINE.

Apparently a percentage of those predisposed to exophthalmic goiter, *i. e.*, possessed of the "Graves' constitution" are sensitive to the effects of thyroid and iodine medication. The following are examples:

CASE 117.—Mrs. N. J., 37, developed exophthalmic goiter within several weeks after beginning a course of self-imposed thyroid drugging in efforts to reduce her weight. She succeeded too well in her task, presenting a severe form of Graves' disease.

CASE 118.—Mrs. T. T., 24, developed Graves' disease after a course of 3 months' treatment for obesity, the "reduction medicine" having been purchased from a mail order concern.

CASE 119.—Mrs. V. W., 44, dated her Graves' symptoms from the time she drugged herself with "goiter medicine" bought over the counter at a drug store.

* Tonsillectomy alone with the expectation of curing exophthalmic goiter is usually disappointing; this procedure should be regarded as supplementary to more direct therapeutic measures in treatment.

CASE 120.—Miss C. F., 30, developed the syndrome shortly after undergoing a self-imposed course of treatment with Lugol's solution for treatment of an alleged goiter.

Comments.—In 2 per cent of our series the disease followed the ingestion of iodine for the cure of an imaginary or actual simple goiter. Since iodine has proved successful in prophylaxis and treatment, these cases would seem to require additional proof of causal relationship.

During recent years the avalanche of quack obesity "cures" described in newspapers and magazines has reached enormous proportions. Approximately 1 per cent of our series presented a history of the ingestion of either thyroid extract * bought over the counter, or a well advertised reducing nostrum, as the only explicable reason for the development of the disease.

The question arises: since thyroid extract ingestion is said by many investigators to be capable only of producing thyroid toxemia in man, how does it produce Graves' syndrome? The answer probably resides in the type of individual taking it, *i. e.*, the existence of predisposition to the malady.

* In this connection it is interesting to note the observation of Friedgood⁶ who points out that (a) iodine does not alter the clinical symptoms of hyperthyroidism induced by the ingestion of thyroid extract in man; (b) iodine has no tangible effect in normal people nor does it prevent experimental hyperthyroidism in man; and (c) the sympathetic nervous system, not the thyroid, apparently plays a major rôle in the pathogenesis of Graves' disease.

Of course, our cases could appear instances of *post hoc ergo propter hoc*, since there is the logical possibility that an individual taking thyroid substance may develop Graves' disease in spite of, rather than because of the drug. Recent experiments by Friedgood,⁷ Loeb⁸ and others indicate that while thyroid ingestion may aggravate the symptoms due to thyroxin, it may simultaneously protect the thyroid gland from hyperplasia. However, discussing therapy from the clinician's viewpoint solely, I would state that almost invariably the administration of thyroid substance to sufferers from early Graves' disease results in speedy development of the typical severe syndrome, and thyroid administration in a typical case quickly results in a perilous crisis. In the cases of Graves' disease under our observation which were previously treated with thyroid substance, the thyroid gland was indeed somewhat smaller than is observed in the average case, but the general condition was critical.

THE THRESHOLD OF GRAVES' REACTION.

In our series of cases the time when the disease asserted itself following the occurrence of a psychic trauma apparently varied with the susceptibility of the individual and the intensity of the trauma. In comparatively few instances the symptoms of the disease appeared to present themselves with hardly a discernible interval of time between apparent cause and effect. In most cases, however, several days or weeks elapsed before the patient became actively aware of significant symptoms.

EXOPHTHALMIC GOITER WITHOUT APPARENT EXCITING CAUSE.

Despite careful history-taking and physical examination, approximately 6 per cent of our series presented no apparent exciting cause at the first interview to account for the onset of exophthalmic goiter; in half of these, the history of a psychic trauma was subsequently elicited. It is felt that in most of these there probably existed a form of psychic trauma difficult of recall to memory. Though it would seem that a psychic trauma followed by the development of exophthalmic goiter would make an indelible impression upon the patient's mind, this is occasionally not the case, especially when bodily injury was not sustained. In many patients in whom there was an unmistakable history of psychic insult, this information was obtained only after the second or third interview, or occasionally through an almost psychoanalytical process. It was then that the event suddenly loomed forth in the patient's mind in all its detail, and the history was completed. Agnes Conrad's⁹ observations in a series of these patients are of particular interest to the historian. She concludes her excellent contribution on the subject as follows:

We do not know what effect different emotional habits in the first year of life may have on endocrine balance. We have all seen the habitus of a child change with altered conditions in the home. Can such alterations persist as a constitutional type characteristic of the difficulty, such as timidity? We do not know. It may well be that the original endocrine endowment of our patient, or that which lies back of the endocrine endowment is responsible for their failure to develop the courage of self-determination. It must be remembered that these people are not lacking in push and economic courage, especially the women, and that some of both sexes have calmly faced great

physical danger, but the stuff that independence of personal ideal, moral self-confidence, is made of, may conceivably be relatively deficient in this diathesis. I believe, at any rate, that the emotional characteristics should be recognized in the concept of Graves' disease.

In Graves' disease we must not hastily regard a history as complete, but we must exercise utmost patience in securing added significant information. Many of our histories require considerably more than an hour of questioning; half the time thus expended is devoted to an inquiry into the mental life of the individual. Occasionally a patient has undergone a psychic trauma the nature of which is distasteful to narrate, hence this information remains unrevealed to the physician.

CONCLUSIONS.

1. In our series of 5000 cases of exophthalmic goiter approximately 90 per cent presented a clear history of psychic trauma which significantly preceded the disease. In 4 per cent of the series there was elicited a history of general or focal infection as the possible exciting cause of the disease. In 3 per cent the ingestion of iodine or of thyroid extract in tablets or in the form of obesity "cures" was regarded by the patients as the cause of the symptoms. In the remaining 3 per cent there was no discoverable apparent exciting cause to account for the onset of the disease.

2. It is felt that in most cases where infections appear to serve as the exciting cause and in those in which no exciting cause was discovered, an undisclosed psychic trauma may have preceded the syndrome. However, infections probably increase susceptibility or intensify the manifestations of the syndrome.

3. It appears that inherent predisposition (Graves' constitution) is a prerequisite to sensitivity to psychic traumata.

4. Individual sensitivity to psychic traumata varies qualitatively and quantitatively.

5. Since psychic trauma precedes the appearance of Graves' disease in the vast majority of cases, this factor would appear to implicate, more or less directly, the higher cerebral centers in the etiology of the syndrome.

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PROBLEMS OF CONVALESCENCE AND CHRONIC ILLNESS.*

A PRELIMINARY DISCUSSION.

By H. FLANDERS DUNBAR, M. D., PH. D., MED. SC. D.

Dr. Strecker¹ once said: "It is not an overstatement to say that fully 50 per cent of the problems of the acute stages of an illness and 75 per cent of the difficulties of convalescence have their primary origin not in the body, but in the mind of the patient." Percentages are given variously by various authors but indicate our general awareness of the practical importance of the psychic component in the reaction of the organism to disease.

On the other hand, we know more about the hazards of acute illness than about the hazards of convalescence, and very little has been said specifically of the "75 per cent of the difficulties of convalescence" that are said to have their primary origin in the mind. We have paid relatively little serious attention to that large group of patients who, already well on their way to an excellent recovery, suddenly and unaccountably develop what we are coming to call the "chronic invalid reaction" and never quite recover. The general physician, as a rule, judges convalescence in terms of the disease process somatically considered and makes his prognosis, judging the likelihood of relapse, on the basis of the organic damage which remains. Patients who remain invalids in the absence of organic damage stand a fair chance of seeing a psychiatrist sooner or later. Many patients with organic damage, however, develop a symptomatology which is very little, if at all, dependent on this damage, and become invalids unnecessarily: and these patients are less likely to receive psychiatric attention.

*From the Departments of Medicine and Psychiatry, Columbia University School of Medicine, and Presbyterian Hospital.

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¹ Strecker, E.: Mental Hygiene. Nelson Loose-Leaf Living Medicine, Vol. VII, Chapter XII.

From an economic and humane, as well as from a scientific point of view, such patients merit serious study. They fill many of our hospital beds and crowd our out-patient departments.

For the sake of concreteness and in order to facilitate investigation of the psychological mechanisms involved, this problem has been studied in serial admissions of patients presenting specific disease pictures where the disease process, at least from an organic point of view, is more or less clearly understood. The following presentation is based on a study of convalescence in serial cardiac admissions, against the background of study of convalescence in diabetic and fracture patients. Of course, some of these patients recovered apparently completely (some of them after vicissitudes), and some developed what we have come to call the "chronic invalid reaction," returning to the hospital as often as three or four times in a year. Among these latter there were some patients in whom the extent of the organic damage may be said to have accounted for the severity and frequency of the relapses. There were some, even with severe organic damage, in whom attacks and relapses were precipitated by definite emotional conflicts who have remained completely free from symptoms after a period of psychotherapy, although the structural damage present, of course, remains.

The purpose of this preliminary paper is not to analyze these groups in terms of percentages nor to discuss in detail the fundamental psychological mechanisms involved, nor to contrast the groups studied. It is hoped to give such material later as part of a larger study of mental factors in organic illness. The accumulation of data concerning psychological mechanisms and the problem of localization of illness requires intensive study and is of fundamental significance particularly to those psychiatrists who are trained to deal with these mechanisms on the deeper levels. It is the purpose of this paper, however, to call attention to certain simpler clinical facts of importance in all three groups studied which are rather generally overlooked, although they are of fundamental importance to the general management of illness and to a cooperative relationship between general physician and psychiatrist.

I. PREPARATION FOR ILLNESS AND ITS COURSE IN TERMS OF IMPLICATIONS FOR CONVALESCENCE.

A. GENERAL CONSIDERATIONS.

Study of any patient in the convalescent period with a view to discovering determining factors in his recovery, or in his tendency to relapse, or to become chronically ill, necessitates study of the disease process itself. Furthermore, study of this process in purely organic terms is insufficient. We often find patients lying side by side having suffered from the same illness, being of apparently the same general constitutional type, and yet making very different types of recovery.

Inquiry into the disease process in such patients brings into strong relief the importance of the predisposition toward or preparation for illness in psychological as well as physiological (including anatomical and constitutional) terms. This has been variously expressed; it has been pointed out that "the bacteriologist . . . no longer teaches that bacillus typhosus, for illustration, is the 'cause' of typhoid fever. It certainly is the only known specific cause, nevertheless the chain of etiology of typhoid fever is made up of other links also, and among them some which he has named 'immunity,' 'resistance,' 'susceptibility,' etc., and these, he knows, the affective psychical states of the patients can easily modify."²

Furthermore, we are beginning to find that many illnesses which the hospital clinician knows only in the later organic phase, pass through a larval (or functional) phase where symptomatology is more or less exclusively a matter of hyper- or hypotonicity, hyper- or hyposecretion, or changes in the ability of the equilibrium to return to stability, changes which are reversible in direct relationship to emotion. The mechanisms in both psychological and physiological spheres, by way of which reversible changes become irreversible, leading to gross anatomical changes, or back to health and normality, can be understood only by taking into consideration the question of predisposition to and preparation for illness.

² Emerson, C. P.: The importance of the emotions in the etiology and prognosis of disease. Bull. New York Acad. Med., 5, 985-1004, 1929.

Emotional factors predispose to illness in several ways. The following points to which attention has been called variously in the literature³ were illustrated in the groups of patients studied. *First*, behavior patterns on the part of the organism resulting from its anxiety and conflicts, may predispose to illness in the sense of actually bringing about its injury from the environment.⁴ Many so-called accidents occur on this basis, and the process operates also in subtler ways, but this fact is sufficiently familiar to need no illustration. *Second*, certain physiological changes, particularly contractile and secretory, occurring in direct response to emotion, may predispose to illness, either directly as in the case of hyperthyroidism and cardiospasm, or indirectly as in the case of peptic ulcer.⁵ Thus, *third*, many symptoms can be understood only

³ For a review of this literature cf. *Emotions and Bodily Changes*. A review of the literature on psychosomatic interrelationships, 1910-1933. By H. Flanders Dunbar. New York: Columbia University Press, 1935.

⁴ Kempf, E. J.: Postural tensions for normal and abnormal human behavior, their significance, *Calif. & West. Med.* 35: 182-184, 272-274, 1931, for example, suggests: "Our postural tensions reveal our way of holding our affective pressure so as to fit it to our situations as we see them. . . . Often the form of the postural tensions reveals the nature of the suppressed or repressed affect." Kempf develops what he calls "the law of neutrality of affective pressure," to wit: "Whatever variations of our affective pressure may be developed, whether love, fear, hate, shame, sorrow or jealousy, they force us to get from our particular environment (or create in it) situations which will counter-stimulate us and neutralize these variations until we return to a state of comfortable equilibrium." In this connection Hoagland's study on "animal hypnosis" is suggestive, especially in his discussion of the animal's two modes of reacting to stimuli, one the usual one studied: appropriate motor adjustments (attack, retreat, manipulation); and one usually neglected: cessation of all movement. (Hoagland, H.: *The mechanism of tonic immobility—"animal hypnosis."* *J. Gen. Psychol.* 1: 426-447, 1928.) Studies of this kind provide an important introduction to the problem of muscular tension and those illnesses in which it is an important factor. The reader interested in this particular subject should follow S. Rado's formulations concerning the general problem of sadism and masochism, also.

⁵ In other words, it has been pointed out that peptic ulcer cannot be psychogenic as, *e. g.*, globus hystericus or cardiospasm; it cannot be the organ-symbolic expression of an emotional conflict and tell the story of this conflict, as it were, in the "organ-language." It is well known that the secretory and motor functions of the stomach are markedly influenced by psychic factors. Accordingly, to the extent to which disturbances of these functions play a rôle in the etiology of ulcer, psychic factors must be recog-

if one thinks of indirect psychic etiology. Hemorrhoids constitute a simple example: one is not inclined to think of psychogenesis of hemorrhoids or to treat them by psychotherapy. On the other hand, hemorrhoids are in most cases the result of constipation, which in turn is frequently psychogenic, either through hyper- or hypotonicity of the intestinal musculature, or both. Thus the hemorrhoids are often indirectly psychogenic, and as a matter of fact frequently disappear if the constipation is cleared up by psychotherapy.

Fourth, and perhaps more important, though less understood than any of the phenomena thus far mentioned (the organism's tendency to subject itself to injury by the environment, or clear-cut physiological changes occurring in response to emotion), is the effect on the organism of chronic emotional stress. It has been pointed out variously, and demonstrated to some extent experimentally,⁶ that emotional stress may limit the adjustability of the organism in the sense of its ability to regain a stable equilibrium physiologically as well as psychologically. This provides additional background for the contention that to be healthy is to be free of anxiety.

Attention cannot be called too often to the fact that in many cases the fundamental emotional stress resulting from anxiety or conflict has been excluded from consciousness, or expressed

nized as etiological. In other words, as far as we are dealing here with psychogenesis, it is not a specific, but an unspecific or indirect psychogenesis. This delineates the psychotherapeutic indications in ulcer, which, on the basis of the literature, may be stated in general as follows: Psychotherapeutic elimination of disturbances in motor and secretory function may be of preventive value. When the ulcer is once established, psychotherapy may aid general medical therapy (or make surgical intervention unnecessary) by eliminating the functional disturbances that may block general medical therapy; it may, furthermore, prevent recurrences which are likely to occur even after successful medical or surgical treatment, unless the functional disturbances have been eliminated. Cf. *e. g.* Schindler, R.: *Die Psycho-neurosen des Verdauungstraktes: Differentialdiagnose, Psychogenese und Psychotherapie*, Bericht üb. d. II. Allg. ärztl. Kongr. f. Psychotherapie. Leipzig: Hirzel, 184-194, 1927. For a discussion of this whole question cf. Dunbar, H. Flanders: *Emotions and Bodily Changes. A survey of Literature on Psychosomatic Interrelationships*, 1910-1933, p. 296, Columbia Univ. Press, 1935.

⁶ Cf. Hochrein, M., J. Michelson, and H. Becker: *Schlaf, Schlaflosigkeit und körperliche Arbeit in ihrem Einfluss auf den Blutchemismus*. *Pflüger's Arch. f. d. ges. Physiol.* 226: 244-254; 738-745, 1930-31.

in the form of an organic symptom, leaving the patient entirely unaware of its existence.⁷ This explains in part the fact that so many patients with organic illness, in whom psychic factors play an important rôle, give the general medical man the impression that they are perfectly normal individuals and when questioned reveal no striking emotional problems. In dealing with the problems of illness and convalescence, however, it is essential that such pathogenic factors do not pass undetected.⁸

The practical importance of the organism's predisposition to and preparation for illness is being recognized more and more generally, at least in the so-called organic sphere. An example is our modern handling of scarlet fever and diphtheria in children with the aid of the Schick and Dick tests to determine susceptibility, supplemented by removal of predispositions wherever pos-

⁷ Psychopathologically speaking, it is obvious why this should be so. The expression of the emotional conflict in somatic symptoms serves in the patient's psychic economy the very purpose of keeping the conflict from the conscious mind. One would not expect, therefore, to find the conflict in the conscious mind, and the cure consists in redirecting the conversion process from the somatic into the psychic channel where it can be dealt with. The conversion process has been described as follows: "Before a conversion symptom can make its appearance, a minutely detailed preparation not only in the psychic, but also in the organic sphere is necessary. Frequently the changes in the organ involved in the conversion take place quite unnoticed, and it is therefore difficult, or actually impossible, to investigate them in their initial stages. For this reason they are often overlooked. When, as occasionally happens, they are discovered, they serve to prove that the transformation from the psychic into the organic is by no means a sudden one and that the transition is not made abruptly—as it were at a single bound. . . . It is in organic illness that the process of conversion finds its secret outlet, which is blocked by inhibitions in the healthy individual." Deutsch, F.: *Zur Bildung des Konversions Symptoms*, *Internat. Ztschr. f. Psychoanal.*, 10: 380-392, 1924.

⁸ The patient may be entirely unaware of an emotional conflict, although this conflict may be the principal etiological factor: "I am stressing this because many colleagues have said to me—'but I've asked the patient over and over if she worries or if she is fearing anything, and she insists she isn't, so I'm sure there can't be any disturbance of this kind.' It is just about as consistent to take the patient's word for this sort of difficulty as it is for you to accept her word that she hasn't typhoid when you know she has, or that she hasn't appendicitis when you know she has an appendix that is about to be ruptured." (Mühl, A. M.: *Problems in general medicine from the emotional standpoint*. *Psychoanalyt. Rev.* 16: 390-396, 1929.)

sible. But this is a principle capable of much wider application as we become increasingly clear as to mechanisms involved. For example, persons whose pattern of reaction is dominated by extreme tension, involving spasm of striated or smooth musculature or both, are predisposed to illness in which muscular spasm plays an important rôle, such as hypertension, peptic ulcer, chronic constipation, colitis, etc. Furthermore, if one such syndrome be cured and the tendency to spasm remains, the individual in all probability will not stay well.

Experience seems to indicate that in most illnesses there is a definite preparation on the psychological side as well as on the physiological side. The significance for convalescence of such factors as those just listed in relation to predisposition to illness will be indicated in connection with typical case histories.

B. ILLUSTRATIVE CASE HISTORIES.

CASE I.—In order to save time I shall begin with the patient presented last year, reminding you only that she had been an invalid for 18 years before she came for treatment and had been treated unsuccessfully for two years in a general medical clinic. Her complaints were stomach trouble and high blood pressure of many years' duration, with in addition, angina pectoris accompanied by severe attacks of palpitation and dyspnea over the two years preceding admission.

Physical Findings.—The physical examination and all laboratory tests, including gastrointestinal series and EKG, were negative except that blood pressure recorded at this time was 190/100 and heart rate 130.

Considering this patient's story in terms of *predisposing* factors to her illness, we find on the *physiological* side a possible hereditary factor in cardiac disease on the part of the patient's mother. On the other hand, assumption of a hereditary factor often blinds the physician to psychic factors which are of far greater clinical importance than a possible hereditary factor. In this patient at least, a large part of what might be called a hereditary factor proved to be "pseudo-hereditary," resting on a psychic basis, involving imitation and identification. Before her initial visit to the medical clinic her father from whom she had been estranged since her marriage, had died of cancer of the stomach. (His first stomach operation had coincided with her marriage in which she had both disobeyed and refused to support him, following which her own gastrointestinal complaints began.) After his death she went

to care for her mother who was suffering from angina pectoris and high blood pressure from which she died six months before patient's first visit to the psychiatric clinic. The patient's attacks of dyspnea and palpitation had begun when she went to nurse her mother, and the anginal syndrome, together with nightmares and sleeplessness, after her mother's death concerning which she felt unaccountably guilty.

These symptoms, furthermore had a definite meaning to the patient which became clear in the course of treatment. She complained that her mother was always nervous and sickly and her father could never earn enough money. She had felt herself overpowered, crushed by the personality of the older sister who took the place of the weak and sickly mother, forcing her to give up school and go to work to help support the sick parents. This situation was a determining factor in her unfortunate marriage against her parents wishes at the end of six years struggle with them and in her subsequent illness. This will be clarified further by way of illustrating certain general conclusions.

The fact that this patient has remained well for two years, there having been no symptom free periods in her 18 years of invalidism, is the more interesting in that her external situation has not changed very much. Although, as I reported last year, the patient's attitude toward her husband changed, and during the first year following the treatment she helped him so much with his work that he went rapidly ahead in business, nine months ago he again suffered serious financial reverses and entered into a new love affair. The patient has reacted to these things on a common sense basis rather than by symptom formation and has succeeded in staying well during the second year since the cessation of treatment although the external situation is again more difficult. The fact that the blood pressure continues at a normal level means that she is to some degree protected against the secondary or organic changes which probably would have developed had her blood pressure persisted, at a level of 200/100.

CASE II.—Another case history is that of a married woman 28 years old with cardiac hypertrophy, mitral stenosis and insufficiency, aortic insufficiency with probable stenosis, and chronic myocarditis, probably on a rheumatic basis, who for two years preceding her admission to the clinic had been incapacitated by attacks of dyspnea, palpitation, cyanosis and fainting so that she

was confined essentially to the house, took all her meals with her mother to avoid the exertion of cooking, etc. This patient (after a period of psychotherapy with no medication) became completely free from these attacks, able to walk considerable distances, and to do her own housework. She is now in the eighth month of pregnancy completely symptom free, although she had been told that should she decide to have a child she might have to spend the last two or three months of pregnancy flat on her back because of the seriousness of her heart disease.

In this patient also there was a definite physiological and psychological preparation for illness. On the *physiological* side, there is a possible hereditary and constitutional predisposition in the direction of disease of the cardiovascular system, from which her father died, although in view of the patient's close association with her father in his attacks, a "pseudo-hereditary" factor has to be considered also. This patient had growing pains following a tonsillectomy which may have been the only symptoms of an actual rheumatic fever. This is the only basis found on which to explain the rather extensive cardiac involvement present when the patient first came for treatment.

As came out during the course of the treatment, there had been an extensive *psychological* preparation of this patient for some type of illness, and a precipitating factor was her fear that her husband would leave her, as well as her fear of pregnancy.*

* In discussing her symptoms, the patient revealed the fact that the attacks of palpitation and dyspnea and the sense of being smothered occurred only when she was waiting for her husband to come home, or when she saw a pregnant woman, never with physical exertion unless in combination with one of these two factors. (She had several such attacks when she saw pregnant women in the clinic elevator.) In associating on the subject, the patient told of her terror when menstruation began. She thought she was bleeding to death and dared tell no one about it, but the boy friend whom she later married. Her tonsillectomy, however, occurred immediately thereafter, and she was again afraid she would bleed to death (a hemorrhage occurred). Furthermore, she fought violently against going under ether, and associates her present attacks of dyspnea accompanied by a feeling of the walls closing in upon her, with this experience.

In discussing the episode of the tonsillectomy, the patient experienced an overwhelming sense of terror accompanied by attacks of dyspnea and palpitation, her lips becoming blue. The patient's resentment against her mother and the fear of loss of her mother's affection were discussed. In this connection she recalled her first cardiac attacks associated with her father's death, and the fact that she had immediately replaced her father by her one life-long boy friend who had been "both father and mother" to her, and

Again, relief of her symptomatology is the more significant in that her husband's attitude toward her has not changed. She herself however, has become much less dependent on him and incidentally no longer runs to her mother at the slightest provocation. In other words, this case like the last one, indicates that it is possible to change the patient's attitude toward a situation even where the situation itself cannot be changed. Furthermore, bringing about such a change in the patient has distinct advantage over the attitude which says, "well anyone would be worried, or would be nervous, living in such a situation. We will see that she gets enough sedative to keep her quiet." It is important to realize that the degree to which perfectly normal worries react disastrously, or produce symptoms, in the physical sphere can be definitely decreased with careful handling of the underlying emotional problems.

These two patients were chosen as illustrating the general problem of convalescence for several reasons. *First*, the first patient had been an invalid for 18 years in spite of the absence of any demonstrable organic damage. The second patient had been an invalid for two years on the basis of serious organic damage. Both have remained symptom-free for two years and are so still at time of printing (3 years), the second patient having remained active until

that now she was about to lose him. She felt he couldn't really leave her when she was so sick. After going over such material as that just indicated the patient became symptom free and remained so for two years without medication and with no definite restriction of diet or activity.

Late in 1933 she came in saying that she had decided that she would like to have a child and wanted to know whether it would be safe for her. She said: "It's funny, I want one now when we have less money than we had before, and then I thought we couldn't have one because of lack of money." Before there was time to go into this question in detail she became pregnant accidentally in January, 1934. She began to dream of her father and to contrast him in her mind with her husband who still neglected her. At the end of the second month of pregnancy, the father of the patient's best friend died. The patient went to the cemetery, and became very nervous when the body was lowered into the grave. All through the next day she felt nauseated and dyspneic. She had the old sense of walls closing in. All of a sudden she hated being pregnant. Then shortly following an automobile ride an abortion took place, which she said afterwards really relieved her very much, although she feared the return of the same old shaking spells accompanied by dyspnea and palpitation rather paroxysmal in character. After this material was worked through came the successful pregnancy referred to above.

3 days before normal term delivery of a normal boy. *Second*, in both patients attacks were precipitated by specific emotional stimuli, *i. e.*, not by every exciting situation, but only by situations or discussions which touched on the patients' underlying conflicts. Symptomatology thus occurring in response to the bringing up of specific emotional material during the therapeutic sessions disappeared after this was worked through. This was true in spite of the fact that in the second case, there remained not only the organic damage but also an additional reason for dyspnea, the pregnancy. *Third*, the psychological component in the preparation for illness in these patients was important. In both of these cases a hereditary predisposition or constitutional diathesis may be assumed although it may be said in no instance to be proven. In each case the picture could be accounted for on the basis of a "pseudoheredity." *Fourth*, the psychological significance of the syndrome for the patient was revealed in each case. The major points made clear to the patient will suffice here without going into the problem of deeper mechanisms which had to be worked out in the course of treatment.

The *first patient* was at war with the home atmosphere, reproaching her parents for not taking care of her. In spite of her open rebellion, six years' struggle were required for her to bring herself to marry contrary to the wishes of her family. Her language when discussing this situation in its various aspects was colored by phraseology relating to the respiratory system: she was "overpowered, crushed, and smothered" by her older sister, she "couldn't breath in the home atmosphere." "I felt an iron hand around my chest"; "I wanted to smother them in their graves"; "I felt as if I might get asthmatic."

The *second patient* was afraid of independence and concealed a great deal from her parents for fear of losing their affection. She was particularly afraid of pregnancy, her attacks often having been occasioned by the sight of pregnant women. To any threatened loss she reacted with attacks and dreams and phantasies in which phraseology relating to the respiratory system was important. She felt she was being smothered or crushed, walls were closing in on her. She thought that "pregnancy shut off your breath"; she was horrified at the thought of people being smoth-

ered in their graves. "I thought how awful if he'd be still alive when they lowered him into the grave"; "I couldn't breath until I got out of the house."

Finally, each of these two cases is illustrative of a group or reaction type that stood out in the total material studied. *First*, as illustrated in the first patient, it may be said in general that there seems to be a psychic constellation related to spasms of the vessels and often of other musculature and body systems simultaneously, no matter what the organic diagnosis is.⁹ Although there is not time to go into the material in detail, this was illustrated in the first case history given, where the patient herself spoke of her tendency to spasms. Incidentally, with the conclusion of her treatment there was a marked decrease in her general muscle tension and a disappearance of her constipation as well as of her hypertension. She lost what she called her tendency to have spasms and the muscles of her face relaxed making her look many years younger. This tendency to spasm is found also among fracture patients in whom also it delays recovery, sometimes helping to bring about recurrences or chronic invalidism. *Second*, as illustrated in the second patient, there seems to be also a psychic constellation predisposing to exaggeration of dyspnea and palpitation, irrespective of the cardiac situation. The dyspnea and palpitation in turn react unfavorably on such cardiac damage as may be present, interfering with sleep, occasioning additional fear, etc.

II. GENERAL CONCLUSIONS.

The material studied confirms the following suggestions which are to be found here and there in the literature:

First, to the usual diagnostic classification of illness some word should be added as to the psychic constellation, and an estimate of the psychic as well as of the physiological and anatomical basis for the symptomatology should be obtained. For example, there is a tendency among internists, particularly with such a syndrome as dyspnea and palpitation in the presence of organic cardiac damage, to base their diagnosis, prognosis and treatment on the extent of this damage, and to look no further. As a matter of

⁹ Cf. Wolfe, T. P.: Dynamic aspects of cardiovascular symptomatology. *Am. J. Psychiat.* 91: 563-574, 1934.

fact, such symptoms may be even more definitely dependent on an emotional factor and more or less completely eliminated in the handling of the emotional problem even though the organic damage persists, as in the second case given.

Evidence has been adduced in the literature that in this way emotional factors may play a rôle in the development of chronic invalidism or hasten the fatal termination of disease of the cardiovascular system. Whether or not we are justified in saying that psychotherapeutic elimination of such symptoms exerts a favorable influence on the course of the disease itself, however, is a question that needs further investigation. Concerning the cases presented we may be justified in assuming definite benefit from the interruption of the hypertension, as well as from the elimination of the sleeplessness and the attacks of dyspnea and palpitation which were exhausting to these patients and kept them constant attendants of medical clinics.

Second, there is evidence that in organic disease the symptomatology is the more abundant and the more devastating depending on the amount of dammed up anxiety present, this being an important factor in the duration of illness including the tendency to relapse. It should be noted here that as was probably observed in the case histories reported, it could have been said that the illness was useful to the patient. In the first case the patient's invalidism obtained for her a good deal of attention, and was a weapon against her husband. In the second case the patient tried to get her husband's sympathy so that he would not leave her alone so much. It should be pointed out, however, that patients do not become seriously ill merely for such purposes. They get sick because the anxiety (perhaps brought to the surface by these situations) is part of a deep-lying neurotic anxiety or conflict. Few things can be more injurious to the patient than pointing out to him his secondary illness gain, or attempting to deprive him of it, without any attempt to relieve the primary anxiety or conflict. If, on the other hand, the underlying neurotic conflict is relieved as the patient becomes clear as to the emotional significance of his symptoms, the secondary illness gain is no longer important and he relinquishes it voluntarily and spontaneously, as happened in both cases.

Third, the detection and relief of conflicts and anxiety is one of the major problems of convalescence, and of utmost importance in preventing relapses and invalidism. Furthermore, the emotional element is important in patients who are not obviously neurotic and in patients whose symptomatology is not such as to be suspect because of its manifoldness or bizarre character.

Fourth, in the patients studied it could be shown that the organic symptomatology had a definite psychological as well as a definite physiological meaning for the patient, the disease process being best interrupted by intervention sometimes from the physiological side, sometimes from the psychological side, but frequently requiring both. This fact calls our attention again to the importance of cooperation between general physicians and psychiatrists in general practice and of psychiatric attendance on general medical wards. There is evidence that handling of such factors routinely would save expense and free many of our hospital beds.

Finally, it is suggested tentatively that the more deep-reaching the psychological component in the preparation for illness proves to be, the more intensive will be the therapy needed. It is this factor, not the trauma precipitating the first or any other attack and not primarily the severity of the illness physiologically considered, which is of importance for the patient's convalescence and safety against recurrence or the development of chronic invalid reaction.

DISCUSSION.

DR. WILLIAM W. GRAVES (St. Louis, Mo.).—All of us are gratified with the progress made in recent years toward bringing about better instruction of undergraduates in the problems of mental medicine. In this direction, medical education has been, and still is, woefully deficient in many medical schools. Were this not true, Dr. Dunbar would not have emphasized this point in her paper. If curriculum makers in our medical schools could each have a copy of Dr. Dunbar's paper, I believe it would contribute largely to the ultimate goal of the Committee on Psychiatric Education. It is, indeed, deplorable that the average medical student, until recent years, received wholly inadequate instruction in psychiatry. It should not be difficult to train the student in orderly history-getting, and the fundamentals of this effort are the family and the personal history. Both are important, if one would understand the patient's feeling, thinking and behavior. Many years ago, a woman came to my clinic in July for an emotional disturbance, and she was wearing a rather heavy waist and three undershirts. I said: "Why do you wear

such clothing in summer time?" She replied: "It is like this, my grandmother, my mother and two sisters died of pneumonia, and I don't want to take any chances." The pseudo-heredity, to which Dr. Dunbar referred, is amply illustrated in this case. Nobody has a perfect heredity. Heredity, as a predisposing factor to health or disease is important, but it is almost equally as important for the student to know what the patient thinks about his heredity. We cannot choose ancestors for our patients, but we can help them to correct their faulty thinking, if we know what they think about their ancestors. The patient's statement concerning his environment from his earliest years onward and what the patient thinks about his illness are surely important components of an orderly history.

Whether it be the worm we tread upon or the complex human organisms, the factors of heredity and environment are common to both. They are the fundamental factors which condition human emotion, thinking and behavior, and they cannot be appreciated without an orderly family and personal history. The evaluation of these factors is the foundation of our helpfulness to the patient, but such evaluation requires time and patience. The student untrained, as is too often the case, in the psychiatric approach to the study of health and disease can never become a safe practitioner of medicine.

DR. LOUIS A. SCHWARTZ (Detroit).—I have been very much interested in Dr. Dunbar's fine presentation. I think it illustrates what Virchow has said, that we ought to treat the patient as well as to treat the disease.

I think it is very important for psychiatrists who work in medical hospitals to do everything they can to help internists and surgeons evaluate the psychogenic factors as they present themselves in relation to physical diseases.

I think it was Dr. H. Emerson who made the statement that every case should have a psychological history taken as well as a medical history. When we see the important work of Draper in relation to body constitution and the growing knowledge about vegetative disorders, referring for example to Cushing's investigations regarding the formation of peptic ulcer in relation to lesions of the hypothalamus, we begin to realize the important correlations between function and anatomic structure and physiology.

I have been particularly interested in trying to evaluate the psychological phenomena associated with cases of tuberculosis, not only in the convalescent and hospital patients but also in cases that come to relief agencies who have very slight pulmonary lesions. They are apathetic, inactive, refuse to work, or fail to make a social adaptation. As psychiatrists we should assist medical men to deal with the psychogenic factors producing the attitudes of these individuals. Many doctors say they are malingering or they are lazy, etc., and to force on these people a work program is essentially unwise. I think the long protracted stay in a tuberculosis hospital, with "infantilizing" diet, with every protection afforded by kindly nursing care in the hospital, may bring out many latent psychological phenomena which will continue the need of that patient for further care in an institution.

I have in mind a patient I am dealing with at the present time, a girl of twenty-six, who had a thoracoplasty on one side, at Saranac for tuberculosis.

She developed the tuberculosis after graduation from college, yet she had had hysterical vomiting since the age of eight. She would vomit at not only an unpleasant idea, but when she was with her father, or even when she went with boys she liked. When she was going out to dinner she would go through a sort of "mental gymnastics" in order to reassure herself. Her condition became so exaggerated that when the telephone rang or people she anticipated seeing were coming to the house, she developed this vomiting.

I am not sure in my own mind whether her physical resistance which had been lowered by the vomiting predisposed her to tuberculosis. A study of the unconscious factors have shown some correlation. It is incumbent on every physician who works in a general medical hospital to study cases going through repeated surgery. Many of these patients are anxious for operations. I think there is such a thing as "focal suicide," as Menninger has described. Many of these patients have their pelvic organs removed, then a gall bladder operation, a duodenal drainage, etc. I think it is important to evaluate the psychogenic factors as far as possible. Many of these patients have abdomens reminding you of a geographical map, through repeated surgery.

DR. H. FLANDERS DUNBAR.—I want to thank the discussers for their comments on this paper, and particularly for their bringing out the place of psychiatry in general medicine. I think that Dr. Schwartz' suggestion ought perhaps to be stressed a little more; that we are sometimes inclined to accuse patients of malingering, to attack them because their illness serves a useful purpose. In the two cases cited in some detail the illness served a useful purpose, that is each patient obtained from it what we may call a secondary gain: one patient was protected from her husband by her illness, and one was getting increased attention from her husband because of it. The important point is that this is actually a secondary not a primary factor, and should never be the first point of attack. This is borne out by the fact that with the underlying emotional conflict cleared away, each patient relinquished voluntarily her "secondary illness gain." On the other hand, if one attacks first this secondary illness gain one succeeds simply in making the patient a little more sick, possibly at the same time altering the type of the symptomatology.

THE CASE OF DANTE GABRIEL ROSSETTI.

A PSYCHOLOGICAL STUDY OF A CHLORAL ADDICT.

BY LOUIS J. BRAGMAN, M. D.

The life of Dante Gabriel Rossetti, the greatest poet *and* painter since Michelangelo, was a darkening pilgrimage.¹ It was a gloomy journey in which he was beset all along the road by a quest for an ideal which existed only in his too fervid imagination, by a catastrophic marriage, by physical and mental illness and by the enslavement to a drug. His whole nature destined him to have a tragic background.² What was the doom that hung over him, threatening him with pain and decay?

If he were merely a psychopathic case and nothing else, says Waugh,³ there would be no problem. Yet here and there he seemed to have transcended his handicaps in a fashion that admits of no glib explanation, despite the fact that there was a spiritual inadequacy, a sense of ill-organization about all that he attempted.

Perhaps the greatest factor contributing to a strange life of enjoyment and mental suffering which bordered on something like pathological extremes⁴ hinged on his early environment. For there was in his family a distinct understanding that he was to be an artist. From the age of four, when he started drawing, his surroundings were such as to stimulate his precocious powers. His father, Gabriele, of Italian ancestry, was a poet, singer, artist and teacher. An eccentric, fantastic figure, a meticulous and absurd worshipper of Dante of the *Inferno*, a student of gnostics and astrology, with a religion of his own which included Swedenborg and the Brahmins, he "left his children with a mild and muddled awe in which to confront a very difficult world."³ He died when his son was 26.

Dante's mother, who outlived him by three years, was devout, simple and dignified, with a warmth of feeling and a talent for making herself a heroine to her children. The family all possessed marked literary and artistic characteristics. The sisters were imbued with a deeply mystical sense of religion, Maria becoming a

nun and Christina an illustrious poetess. William is known as a writer and the biographer of his famous brother.

Born in 1828 into a home, then, in which artistic expression was a normal activity, Dante Gabriel, the second of four children, had, as far as records show, a happy childhood with no obvious conflicts at first, with understanding, sympathetic, helpful parents who let him work out his predestined career as an artist. It is significant, however, that he soon reversed his actual given name of Gabriel Charles Dante to avoid being confused with his father. One senses the beginning of friction between parent and son, particularly when he showed an early resentment against any knowledge of the author of the *Inferno* as a protest against his father's Dante-mania. In addition he manifested a general tendency to depart from his father's opinions regarding subjects on which they both spent much thought and feeling. Then paradoxically, at 17 he started his translations from Dante, and subsequently enmeshed himself considerably in Dantesque lore.

Although significant features of his more personal life seem to have been withheld from his biographies, it is quite definitely established that in his earliest days he was singularly pure-minded. On the threshold of manhood, with a virginal concept of woman and love, he aided in the organization of the Pre-Raphaelite Brotherhood, which had for its basis the idea that purity of mind and heart was necessary for the creation of good works. This circle of young men of untainted ambitions, to whom the sensual and the gross were to be tabooed, aimed to revive the mysticism of medieval art and sentiment. As a result it has been claimed that Dante created "the not quite natural ladies who languish in his pictures";⁵ the woman with straight lines, slender, ethereal, unduly spiritual, supersensual, no longer expressing the free personality of the mature, complete female, but approximating the infantile, asexual habitus.⁶

For Dante was now showing a typical adolescent reaction, an escape from the realities of sexuality which was to dominate his art and his ways the rest of his life. Never actually an ascetic or a Puritan, yet he had no juvenile amours or flirtations. Woman was a great mystery to him, his one absorbing interest which he was endeavoring to sublimate by his quest for the eternal ideal Type. No poet or painter has ever given so much attention to

woman; woman (and flowers) were the only objects worth painting; and the same woman is in all his paintings. The spirit of woman was his one persistent occupation. At least half of his works represent an effort to express his idealization forcibly and permanently. He constantly exalted the mystery and the attraction and the physical beauty of woman: she was the mediating *logos* between the flesh and the spirit.³

This manifestly suppressed sensuous nature gained a firmer foothold on him as he grew older, and becoming highly-sexed he strayed into the byways of passion. The details of this side of him have been deliberately omitted from the records, yet he is reputed to have had wayward impulses. There were many rumors of misconduct, and he showed a belated sex-drive in which, although no profligate, his various amours were swift and unscrupulous, characterized by insolence of inception, energy of enjoyment and vagueness of termination.¹ He relished the adventures of promiscuity, and of grotesque encounters.³ His poem *Jenny* reveals a sentimental interest in prostitution. It is a sermon, he says, and on a great world, to most men unknown. In the middle of life he plunged heavily into that world.

His faults and failings sexually, whatever they were, resulted from a lack of restraint by the ordinary social codes or views of morality. One consequence may have been a chronic ailment which suggests gonorrheal urethritis. His brother William wrote: "Towards the autumn of 1866 he became subject to a complaint (I do not care to define it) which required surgical treatment from time to time. The first instance was in August, 1868. He minded this not at all; and I have seen him resume painting within five minutes of one of the slight operations." Baum adds that William makes Dante's troubles in this regard "as mysterious and as fascinating as *My Uncle Toby's wound*."

In fact Rossetti must have suffered intermittently, after his 40th year, from an urethral stricture which required frequent catheterization. Watts says⁷:

He had for years been subject to a certain organic disturbance which, though under timely and skilful treatment it is not considered to be dangerous, will become full of peril, and will, indeed, end fatally if, in certain of its developments, it is neglected or treated unskilfully. In 1877 this ailment took a somewhat serious form. Yet our friend, the eminent surgeon, John Marshall, was not greatly alarmed, knowing that, should it occur that the

symptoms did take an aggravated turn, he had but to perform a surgical operation in order to give relief. This operation, however, was of great delicacy, and the aggravated symptoms necessitating it were apt to come on suddenly.

The incident in 1877 was due to delay in treatment, and took the form of a rupture of some internal blood vessels, after which he was ill two months. The entire condition, however, because of its benign nature, was but incidental to the larger picture of his disturbed constitution. For there were many other physical disorders which lent weight to his difficulties. He was apparently in good physical health to the age of 38, except for an episode at five, when he suddenly became weak in his legs. He was cared for by Benjamin Brodie, the eminent surgeon, and wore splints for three or four months. This may have been infantile paralysis, but details are lacking to substantiate this opinion. At 30 he suffered from neuralgia, perhaps of minor consequence. At 39 he began to have trouble with his eyes, and as his father was threatened with blindness in his closing years, Dante was for a long time apprehensive of his sight. Sunlight and artificial light became increasingly painful, producing sensations of giddiness and dazzling him. He was confused in dim light, was bothered by after-images, stumbled against objects and complained of a film as of curling smoke or effervescing champagne always before his eyes. Despite these symptoms, the oculists William Bowman and Bader said the eyes were not organically affected, attributing the trouble to weakness, overstrain and nervousness. He was never a martyr to personal suffering, says Caine,⁸ calling attention to his neurasthenic attitude towards an innocent hemoptysis which manifested itself periodically. "He never failed to become convinced that he spat arterial blood, and that on each occasion he had received his death warrant." He told Caine that he was lacking in personal courage.

At 46 he was broken in mind and body. His nervous troubles seemed to eat out his vitality and to overthrow his robust spiritual constitution.³ The death of his wife was the turning point.

He became engaged to Elizabeth Eleanor Siddal in 1851, falling in love with her on sight. She was 18, and soon became a model for him and his artist friends. Because of her illness from tuberculosis the marriage was persistently postponed for nine years. The long engagement was a considerable strain on him, and the

marriage turned into an imperfect partnership. Neither by habits nor by temperament was he well-adapted for married life. At the end of the first year a still-born child added to the strain, and his wife died a suicide from an over-dose of laudanum a year later. Waugh summarizes this tragedy, as affecting him, in an apt fashion:

In the full vigor of youth and the exultation of his first love, he found himself brought up sharply by the icy breath of corruption and mortality in the being most dear to him. Love withered at his approach. At the very blossoming of his genius and reputation he was marrying a dying woman.

Of this he must have had a presentiment, for, as Benson ¹ says:

It is an inexplicable thing, especially in a man of profoundly superstitious nature, that Rossetti should, on his marriage-tour, have completed from an early design one of his most impressive drawings, "How They Met Themselves," where a lover and a lady, the latter drawn from Miss Siddal, are confronted in a dark woodland by the wraiths of themselves, a presage of death. There is a breathless horror about the picture in its completed form which testifies to the strength of the mood which originated it.

After her death he was not constantly mournful and dejected, because of his varied interests and energy of mind, yet he did have a pronounced sense of loss and of guilt. Caine says: "Rossetti had never ceased to reproach himself with his wife's death as an event that had been due in some degree to failure of duty on his part, or perhaps to something still graver." This refers perhaps to the implication that his neglect of her, his interest, well-known to her, in another woman, goaded her to take her life. Feeling that the poems (at that time unpublished) which he had written, were composed in neglect of her, he tried to atone by placing the manuscript in her grave. He waited seven and a half years to write again, disinterring the poems in 1869.

Four years after her death he became interested in spiritualism, wanting to prove, if possible, the continuance of life after death. Of this Watts-Dunton wrote, in *Aylwin* (a romance which gives an unrealistic picture of the life of Rossetti):

Ask any man who has passionately loved a woman and lost her; ask him at what moment mysticism was forced upon him—at what moment he felt he must either accept a spiritualistic theory of the universe or go mad; ask him this, and he will tell you that it was at that moment when he first looked upon her as she lay dead, with corruption's foul fingers waiting to soil and stain.

But it was not his passionate love, for that had long since vanished. Rather it was his inner conscience, his feelings of blame that intensified his earlier predilections for metaphysics. And as his mysticism deepened, after 1862, his love for the fleshly things increased. Watts-Dunton says: "In the later years, the mystic temper dominated all his energies, leading him back to a spiritualization of the flesh, but not to asceticism." He affords in this regard another instance of the psychology of mysticism and sexuality, in which it would seem that spirituality and sensuousness are counterparts of an ecstatic nature. The task of his life, says Hueffer (quoted by Baum), was "the embodiment of mystical passion." Brooke⁹ adds that his love of the supernatural, his mysticism and asceticism, are manifestations of the desire to restrain the appetite and sensual enjoyment in order to be able to contemplate more quietly and to realize more fully the spiritual ideas and the spiritual world in an impassioned imagination.

In 1869 his mysticism took the form of a definite delusional experience, as told by Scott:

The circumstance I am now to relate, indicating the subversion of reason itself, it appears to me highly desirable to place on record. It is a problem for doctors and psychologists alike. Mounting the ascending road towards Bass, we observed a small bird, a chaffinch, exactly in our path. We advanced; it did not fly but remained quite still, continuing to do so till he stooped down and lifted it. He held it in his hand: it manifested no alarm. "What is the meaning of this?" I heard him say to himself, and I observed his hand was shaking with emotion. "Oh," I said, "put the pretty creature down again. It is strange certainly: it must be very young, perhaps one which escaped from a cage." "Nonsense!" was his reply, still speaking *sotto voce*, "You are always against me, Scott. I can tell you what it is, it is my wife, the spirit of my wife, the soul of her has taken this shape; something is going to happen to me."

Several years previously he began to be disturbed by insomnia. In *Sleepless Dream* he asks:

" . . . why does Sleep . . .

Tread softly round and gaze at me from far?"

And in the poem *Insomnia* he writes:

"Thin are the night-skirts left behind
By daybreak hours that onward creep,
And thin, alas! the shred of sleep
That wavers with the spirits' wind."

It will be shown shortly that he sought a dangerous method of wooing sleep, in 1868, by drinking heavily of whiskey and taking large quantities of chloral. For he was becoming highstrung, restless and melancholy, and he talked frequently of suicide. In 1869, when his nervousness was very much in evidence, he discussed the ethics of self-annihilation. Scott found him "more hypochondriacal than ever," and felt that his daily talk of suicide was undermining his courage.

In 1872 William said that his brother was now an actual monomaniac, talking wildly of conspiracies against him, saying that people were trying to decry and defame him, and that there was a widespread and carefully organized conspiracy to hound him out of society. Browning's *Fifine At the Fair* was an attack on him, he thought; and Lewis Carroll's *The Hunting of the Snark* was a pasquinade against him. These delusions seemed to have started simultaneously with an actual literary vicious criticism of his poems, in an article by Buchanan¹⁰ who called him a decadent poet. Rossetti, said Buchanan, showed a needless voluptuousness and a morbid deviation from the healthy forms of life. There was nothing completely sane in his works, for they revealed a sickening desire to reproduce the sensual mood. *The House of Life* was a hotbed of nasty phrases, and some of the sonnets were stenchd with one profuse sweat of animalism. In the light of present-day literature and art, the charm and power of his works subsists in their sensuous nature, but the vituperativeness of the diatribes was too much for his already tottering nervous system.

He was examined by Dr. Maudsley, the distinguished psychiatrist, who considered his mind unhinged. In 1874 the morbid delusions continued, and he became suspicious of his friends. The next year airy voices taunted him in terms of gross and unbearable obloquy, and cabmen rang their bells to annoy and insult him. He swallowed a large quantity of laudanum with suicidal intent, prompted by some hallucinations, following which he was in a lethal trance for two days. A hemiplegia which lasted for a half year was attributed to a "serous apoplexy" incident to the effects of the laudanum.

He continued deeply depressed and imagined he could paint no longer, although intervals of good health and important creative work followed to the end. In 1881 he had another attack of

paralysis in the right arm and leg which cleared up in a few weeks. The following year he was prostrated physically, was unable to take more than a few steps alone, and was half-blind. Dr. Harris believed he had some degree of brain-softening on account of his abuse of chloral. He died in April, 1882, of kidney disease accompanied by uremic manifestations.

Trombly¹¹ says that Rossetti "had gone down into the long, stuffy night of chloral." Dante himself confessed to Caine: "They say there is a skeleton in every cupboard, and that's mine; it is chloral." The hydrate of chloral was introduced as a *safe* drug for sleeplessness in 1869. About that time he was so greatly troubled by insomnia that he had to stop work, and a friend, W. J. Stillman,¹² recommended the soporific. It was to be prepared by dissolving 30 grains in three ounces of water, and one-half ounce of this mixture was to be taken for three nights in succession. Then he was to omit it for three nights. Instead, he took three doses at once, but was dissatisfied with the results, since it produced a short fit of profound stupor, after which his restlessness was worse than before, and he refused to try it again. Three months later he seemed to sleep better, but at a later date, on advice of a physician, he resumed its use. But of his own accord he increased the specified dose, and soon was having the prescription filled by several druggists at the same time, as the amount did not satisfy his craving. This he did, says Watts-Dunton, because his was a self-indulgent and impatient nature.

The average dose of chloral as a soporific is from five to fifteen grains. Gosse¹³ says: "I am told that no case has been recorded in the annals of medicine in which one patient has taken so much, or even half as much chloral as Rossetti took." His initial dose is not recorded, but he gave way to it little by little, and his descent physically and mentally was inevitable. It was some years later, however, that it produced any sensible effects of an injurious nature. Subsequently it soared from fifty to one hundred and eighty grains a night. He said to Craine: "I have just taken 60 grains of chloral; in four hours I take 60 more, and in four hours after that yet another 60." When Caine asked if the dose did not increase from time to time, he replied: "It has not done so perceptibly in recent years. I judge I have taken more chloral than any man

whatever: Marshall says if I were put in a Turkish bath I should sweat it at every pore."

When he had attained his maximum dose his friends and druggists secretly diluted it to one-half or one-third when they were able. In 1876 he wrote: "I have been seeing Sir W. Jenner today in consultation with John Marshall, and they have prescribed me the awful ordeal of two nights entirely without chloral! This will be utter sleeplessness; and my only resource will be to try to read in bed." It was probably at this time that he tried mesmerism as a substitute for the drug, with good results. In September, 1876, he said that his own nights were much improved of late, that he had no pains in the limbs for some time past, "the mesmerism seeming to have carried them off," and that he took only about half or less than his customary chloral. But he could not get along without it. He wrote to Brown:

The fact is that any man in my case must either do as I do, or cease from necessary occupation, which cannot be pursued in the day when the night is stripped of rest altogether.

In 1879 he was very ill for a week due to a more than commonly excessive dose of chloral. Subsequently morphine was substituted, at first by hypodermic injection, then by mouth. During this time he was delirious for many hours, and suffered physically many of the customary drug-withdrawal symptoms. Three or four mornings after the experiment he awoke calm in body and mind, but it was expedient to continue the narcotic until the end, which was quite near at hand.

The chronic chloral addict is reputed to manifest a train of physical and mental symptoms. A tolerance is soon acquired and the habitué resembles a victim of chronic alcoholism or morphinism. Various results have been described: cachexia, anemia, disturbances of the gastro-intestinal tract, loss of appetite, enfeeblement of the will, weakness of energy, persistent drowsiness, mental depression and other psychotic states, sometimes including delirium, confusion and hallucinatory and paranoid reactions.

Chloral worked insidious mischief on the nervous system of Rossetti. His brother felt that "chloral had little or no power over that part of his mind which was purely intellectual or inventive, but only over that other part which was emotional, and was applied to the construing of himself and his surroundings." It produced

in him a deep melancholy with weakness of will. He himself said that he did not get any real sleep from it, but only a trance-like state. It gave him unconsciousness without adequate repose or refreshment.

Caine said that his delusions grew out of the drug that "blighted half his life," and that it brought on occasional distrust of friends, fear of enemies, broken health and shattered nerves. He adds: "I believe that the drug by which he was enslaved caused what I may best characterize as intermittent waves of morbid suspiciousness as to the good faith of every individual, including his best, oldest and truest friends, as to whom the most inexplicable delusions would suddenly come, and as suddenly go."

Marshall told Caine that "chloral was merely a desperate attempt to cure his evils, not the cause of them." Quilter was apprehensive of "the fatal influence of chloral withering Rossetti's powers," and adds that "the most remarkable thing about chloral is that while it produces melancholy, suspiciousness and all kinds of illusions, it can leave the executive functions untouched." And Marks,¹⁴ similarly believing that the quality of his work was not interfered with, for there was no mental deterioration, writes:

Chloral seems to have made Rossetti in his personal relationships a victim of morbid and causeless suspicion of his friends—those who were closest to him. Unquestionably his addiction made him an object of pity to those who loved him. . . . The loquacity of the foolish boastfulness about the enormously large quantities of chloral which he took, his imaginary literary and personal enemies, his increasing and distrustful irresolution, his occasional and bitter violence of temper, were all gifts from the great and only enemy of Rossetti's life—death-dealing chloral.

There are many aspects of his personality which imply that he had an unstable temperament. Benson¹ suggests that his might have been affected, decadent, fantastic figure of a dreamer. Of a seclusive makeup, he shrank from the ordinary amusements of life. He had a too active and an unappeased imagination. Waugh considers him a tragic and a baffled figure. His sonnet-sequence, *The House of Life*, which is a record of his intellectual and emotional experiences, shows his disillusionment and melancholy. His poems for the most part express poignant passion, the tragedies of blighted love, and the blind recklessness that follows.

To Rossetti, as has been said, woman was the most compelling of the manifest forms of beauty. His wife typified his early sim-

plicity and interest in cloistral purity; Fanny Schott, to whom he turned as the beauty and strength of his wife declined, brought out his voluptuous side; and Jane Morris stood for the haunting melancholy and frustration at the close of his career.³ Hueffer, describing his wonderfully deep conception of the female type of woman in her relation to man, considers this the keynote to his creative power.

Symons,⁵ after stressing the personal tragedy in the life of Rossetti, finds that he lived a life of unreality:

Rossetti, with all his keen practical intelligence, was never wholly awake, had never gone outside that House of Dreams in which only the real things were the things of the imagination Rossetti as well as his associates were phantasts, looking for an ideal which existed only as in their imagination. . . . He died of too much dreaming, of too passionate a desire after beauty, which at last literally took his sleep from him, and set him wandering about the streets at night, and closed him in finally upon a drugged atmosphere of hallucinations. He was not powerful enough to turn out the guests of his brain, when they had come to haunt him like phantoms.

Finally, says Symons, the great artist became melancholy, and his work expressed this state of mind. "The pictures of his last years [and probably the Sphinx Sonnets] are strange documents of the degeneration of his mind." Baum felt that "without the dual outlet of poetry the man would have gone mad." But mad he truly can be considered, conditioned as he was by his earlier training, his marriage tragedy, his memories and anxieties and conflicts following the loss of his wife, his distress over his failing eyesight and the pain and discomfort of his other physical disturbances, his insufferable insomnia and his chloral enchantment. For, as Baum concludes:

To preserve the balance of sanity in what can hardly ever be regarded as quite sane or "normal" is the almost impossible problem of pure mysticism. The fusion is for those only who can burn continually with the hard gem-like flame; for the rest the solution is always on the verge of decomposing into its components. Rossetti, with all his fine qualities, was too weak a vessel to hold together, in the tremendous heat of this double fire.

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THE BLOOD FAT IODINE NUMBER.

PRESENTING THE EXPERIMENTAL BASIS FOR AN EXACT DIFFERENTIAL DIAGNOSTIC PROCEDURE.

By ARTHUR T. BRICE, B. A., M. T.,

*Associate Medical Bacteriologist, U. S. Veterans' Administration Facility,
Palo Alto, Calif.*

The high relative percentages of fatty substances in brain and nerve compared to other organs point to the extreme probability that any disturbance of function of brain or nerve should be accompanied by some disturbance of fat metabolism. There is also a rather striking parallelism between the theory of nerve physiology and the hypotheses of fat metabolism. In broad terms both postulate the existence of a mechanism which upon being placed in motion by a suitable stimulus operates to release to the use of the organism certain reserve stores of energy.

That the fats are primarily involved in these releases of commonly called nervous or emotional energy has been amply demonstrated. Cats put under emotional stress by exposure to a barking dog show uniformly striking increases in the concentration of fat in the blood.¹ Groups of mental patients in states of emotional exultation show significantly higher blood fat levels than comparable groups in states of apathy.² A group of mental patients exhibiting more marked reactions to external psychological stimuli showed higher levels of blood fats than a comparable group showing lesser reactions to such stimuli.³ A group of stuporous apathetic catatonic patients exhibiting some slight reaction to a definite psychological stimulus showed immediately after the application of the stimulus significantly higher levels of the unsaturated fats of the blood and higher iodine numbers than a comparable group that exhibited no reaction to the same stimulus.³

The first step of the process by which the fat reserves are drawn upon consists in the desaturation in the liver of the saturated fats from the tissue depots. The iodine number of the blood fat is therefore an index of the extent to which these reserves are being called into use by the organism.

I have reported elsewhere the finding that in dementia præcox the quantity of fat in the blood is significantly lower than normal³ and that continuous feeding of a high fat diet for as long as seven months failed to elevate these levels to any extent or to produce any clinical change in the mental symptoms of these patients.⁴ Since these findings have been reported six cases of manic psychosis have been maintained on a high fat diet for a period of six weeks. Two manic types that were in partial remission during the period showed no significant elevation of the blood fats nor any noteworthy clinical change. Four cases including three manic and one depressive types which were in the more active phase of the manic cycle all showed distinct elevations of the blood fats and became markedly more hyperactive.

During the course of these investigations 107 determinations of the blood fat iodine number were made in 17 cases of schizophrenia and 32 determinations in seven cases of manic psychosis. The data obtained from the two groups are comparable statistically as both groups were on the same diet and all specimens were taken before breakfast after an over-night fasting period. All determinations were carried out by the same technic the limits of error of which have been elsewhere recorded.³ The data will be analyzed according to customary statistical practice when more than one test has been taken from any given individual. The individual will first be considered as the unit, the value in each case being the value of the first determination obtained. The test will next be considered as the unit and finally the individual averages will be considered.

I. *The Individual as the Unit.*—Weight of data: 17 cases of schizophrenia, seven cases of manic psychosis. Schizophrenia mean iodine number 107; standard deviation ± 11.8 ; probable error of mean ± 2.9 . Manic psychosis mean iodine number 126; standard deviation ± 11.8 ; probable error of mean ± 4.6 . The difference between means is 3.5 times the standard error of the difference and therefore statistically significant. 76 per cent of the schizophrenia values fall below the manic lower limit. 86 per cent of the manic values fall above the schizophrenia upper limit. 82 per cent of the schizophrenia values are below the manic mean. 86 per cent of the manic values are above the schizophrenia mean. If the iodine number 120 had been taken as the differential point and all values

above 120 considered manic, all below schizophrenia, the manic diagnoses so established would have agreed with the clinical diagnoses 86 per cent, the schizophrenia diagnoses 82 per cent of the times.

II. *The Test as the Unit.*—Weight of data: 107 tests from schizophrenia, 32 tests from manic psychosis. Schizophrenia mean iodine number 115; standard deviation ± 16.4 ; probable error of mean ± 1.6 . Manic psychosis mean iodine number 127; standard deviation ± 18.6 ; probable error of mean ± 3.3 . The difference between means is 3.3 times the standard error of the difference and therefore statistically significant. 36 per cent of the schizophrenia values are below the lower manic limit. 34 per cent of the manic values are above the upper schizophrenia limit. 76 per cent of the schizophrenia values are below the manic mean. 69 per cent of the manic values are above the schizophrenia mean. If the iodine number 120 had been taken as the differential point the manic diagnoses so established would have agreed with the clinical diagnoses 69 per cent, the schizophrenia diagnoses 66 per cent of the times.

III. *The Individual Average as the Unit.*—Weight of data: 16 cases of schizophrenia, seven cases of manic psychosis.

Schizophrenia mean iodine number 114; standard deviation ± 8.5 ; probable error of mean ± 2.1 . Manic psychosis mean iodine number 128; standard deviation ± 7.1 ; probable error of mean ± 2.8 . The difference between means is 4.0 times the standard error of the difference and therefore statistically significant. 87 per cent of the schizophrenia values fall below the lower manic limit. 85 per cent of the manic values fall above the upper schizophrenia limit. 94 per cent of the schizophrenia values fall below the manic mean. 100 per cent of the manic values fall above the schizophrenia mean. If the iodine number 122 had been taken as the differential point and all values above 122 considered as manic all below as schizophrenia, the manic diagnoses so established would have agreed with the clinical diagnoses 85 per cent, the schizophrenia diagnoses 87 per cent of the times.

CONCLUSION.

There is a statistically significant difference between the blood fat iodine numbers in schizophrenia and manic depressive psychosis.

The difference is most marked when a number of tests are obtained from the same individual and the individual average considered as the unit. The determination of the blood fat iodine number would seem to be a valuable procedure for the purpose of classifying cases over which there might be disagreement of opinion or the diagnosis be in any doubt.

Acknowledgment of assistance and cooperation in carrying out the work reported is due to Dr. Chester L. Carlisle, clinical director, and Dr. Marcus C. Terry, pathologist, under whose supervision the work was done; also to Dr. R. E. Toms, Dr. J. W. Wills, Dr. R. H. Leece and Dr. R. O'Neil, ward surgeons in charge of the patients; and to Mrs. Hessie E. Waldsen and Miss Faye Krall, dietitians, at the U. S. Veterans' Administration Facility, Palo Alto, California.

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ANTICIPATIONS AND CORROBORATIONS OF THE FREUDIAN CONCEPTS FROM NON- ANALYTIC SOURCES.*

By A. A. BRILL, PH. B., M. D.

Ever since psychoanalysis began to attract the attention of the scientific world a number of hostile critics have maintained that those Freudian views, which they consider sound and logical, were discovered by others or were known before Freud came on the scene. As Freud's discoveries touch the whole gamut of human feelings, it would indeed be strange if one should not encounter similar views expressed here and there by others. But deeper investigation readily shows that whereas some have anticipated something, some fraction of his theories, none has ever expressed one of his basic principles. Janet is the only one who actually claimed that Freud usurped some of his views, but this has been amply disproved by Freud, Jones, and others.¹ Freud, himself, has always given full credit for any idea that he has adopted from others. There are numerous references in his works to the great part played by Breuer in the beginning of his scientific career, and when his attention was called to the fact that someone had anticipated any of his views, he never failed to acknowledge them. One should read, for example, his gracious acknowledgment to Schopenhauer of the idea of repression, when Rank pointed it out to him. But when one reads this reference in "The World as Will and Idea,"² one doubts whether Rank would have noticed it if he had not been at the time thoroughly impressed by Freud's theory of repression. In the same manner Freud speaks of Nietzsche, who intuitively sensed some of the theories laboriously

* Read at the ninety-first annual meeting of The American Psychiatric Association, Washington, D. C., May 13-17, 1935.

¹ Freud: History of the psychoanalytic movement. Translated by Brill, p. 24, *Journal of Nervous and Mental Diseases*, Monograph Series, 1916; and *Die Medezin der Gegenwart in Selbstdarstellung*, pp. 4 and 9, Felix Meiner, Leipzig.

² Rank: *Zentralblatt für Psychoanalyse*, 1: 69, 1911.

worked out by Freud on the basis of clinical material. Freud claims that at that time he had not read the works of these philosophers.³ Similarly, in speaking of his dream theories he states: "The most characteristic and significant part of my dream theory, namely, the reduction of dream distortion to an inner conflict, to a sort of inner dishonesty, I found later in an author to whom medicine but not philosophy was unknown. I refer to the engineer, J. Popper, who wrote under the pseudonym of Lynkeus." But reading Popper's passages in the light of the enormous work of "The Interpretation of Dreams" one cannot help admiring Freud's liberality. Indeed, Freud's friends have always felt that he was too generous in this respect. It would be a laborious task, quite impossible here, to go further into this subject. Suffice it to say that both opponents and friends have discovered many similarities between Freud's theories and those of others, and only a few years ago a friendly author, Dr. Dorer,⁴ in an interesting book on the historical foundations of psychoanalysis, traced all of Professor Freud's theories to the direct influence of his former teachers. This work lacks the familiar and affective touch of his pupil, Fritz Wittels,⁵ but it is interesting and useful as a summary of similar works hitherto attempted by others.

It is interesting to note that none of Freud's opponents have ever attempted to attribute any of his sexual theories to anyone else. All of them blame him and him alone for having injected sex into the neuroses. Yet, Freud, himself, maintains that this cognition was inspired in him through casual remarks uttered at different times by three of his teachers; namely, Breuer, Charcot, and Chrobak.⁶ "But I did not understand at that time," he states, "what these authorities meant; they have told me more than they themselves knew, or were prepared to acknowledge. What I heard from them slumbered ineffectually within me until it casually emerged, seemingly as an original cognition, during my investigations of the cathartic method."⁷ As a matter of fact, the association

³ *Die Medezin der Gegenwart*, etc., *l. c.*, p. 43.

⁴ *Historische Grundlagen der Psychoanalyse*. Felix Meiner, Leipzig, 1932. Reviewed in the *Journal of Nervous and Mental Diseases*, p. 581, May 1935.

⁵ "Freud and his times."

⁶ "History of the psychoanalytic movement," p. 6.

⁷ *Die Medezin der Gegenwart*, etc., *l. c.*, p. 13.

of these remarks with his sexual theories had not become conscious to him until he wrote the history of the psychoanalytic movement in 1914. It seems, therefore, that even his great dictum, "In a normal *vita sexualis* no neurosis is possible," a statement which arrayed the whole medical world against him, that this, too, was not altogether original. Indeed, some time later Havelock Ellis called attention to the fact that Freud's reduction of hysteria to sex can be traced back to the oldest period of medicine, to Plato's matrix theory, as expressed in his *Timæus*.

Freud tells us that the character of a person represents the sum total of his past impressions, and we who worked with him know that an impression, whether in the form of a sensation or an idea, is never lost. Bearing this in mind, we can agree with those of his opponents, who claim that some of Freud's views have been expressed by others, and with his pupils and friends like Wittels, Dorer and others, who trace some of Freud's ideology to his former teachers. No doubt of that, but we add that Freud created a great system out of these isolated fragments. By coördinating all his knowledge, from his early life, school, teachers, and last but not least his own empirical knowledge, he developed the flexible science of psychoanalysis, an achievement to which nothing in the history of medicine can be compared.

These remarks are to serve as a preliminary to what I wish to bring before you. A few years ago I purchased a work on Hippocrates,⁸ which I read with much pleasure and interest. Beyond the hackneyed expression "Hippocrates is the father of modern medicine," I hardly knew anything about this great personage. The more I read about Hippocrates, the more fascinated I became; his sayings and precepts were so stimulating, so fresh, and seemed so timely that I forgot for the time that they were uttered by one who died in 346 B. C. Moreover, I was particularly intrigued when I read in the fifth chapter of this book a description of a psychoanalysis made by Hippocrates in the most modern Freudian manner. According to this version, King Perdicas of Macedonia suffered from a peculiar malady, which no one could properly diagnose. It was thought to be consumption or some other organic disease, but neither the symptoms nor the reactions to the treat-

⁸ Baisette: "Hippocrates, his life and doctrines." German translation by Bruno Hepner: Hippokrates, Verlag, Stuttgart, 1932.

ment confirmed the diagnosis. In his distress the King sent for Hippocrates, whose reputation as a great physician was known throughout Greece. When Hippocrates came to Macedonia he found that Euryphon, the well-known leader of the Cnidian School, the rival of the Coan School headed by Hippocrates, had arrived ahead of him and had charge of the case. Both of these schools of medicine flourished during the time of Hippocrates, both of them were highly regarded and both of them had the same origin: they were both Asclepiades. That Cos had become famous is altogether due to the person of Hippocrates. Dr. Mûch in his penetrating work⁹ comparing the two schools says that Cnidos equals science, while Cos equals art. Cnidos started from the particular and attempted to deduct laws from these individual details to be applied later in similar circumscribed area, whereas Cos started from the general and strove to formulate rules but did not thereupon treat the individual symptoms in the same manner in every case, on the contrary it treated the individual case in entirely different ways. Euryphon thus pursued the methods of treatment as expressed in the Cnidian Sentences, but after two months of unsuccessful treatment he was displaced by Hippocrates. The latter discarded all the salves and drugs ordered by his predecessor and set out to investigate this mysterious ailment in a more general way, starting in by gaining the King's confidence. He spent much time with his patient, took walks with him, and questioned him minutely about his feelings, noted his memory disturbances, his dreams, and informed himself about his relations to his father, Alexander the Rich. As to that, the patient claimed that he had always been very attached to his father, but could not explain a dream in which he had seen his father surrounded by thousands of slaves. When he wished to approach, a lance, which was stuck in the ground, began to swing to and fro, and kept him away from his father. It was impossible to pull this lance out of the ground, and his father vainly extended his arms to him. This dream repeated itself with some modifications; sometimes, the father was alone and sometimes with his concubine, Phila. On further analysis Hippocrates found that Phila, who was slightly older than Perdicas, had been his playmate until she was 14, when she became his father's favorite. Phila was only 19 when Alexander

⁹ Hippocrates der Grosse, Hippocrat-Verlag Stuttgart, 1926.

died, and while she remained in the royal palace, Perdicas saw little of her. The investigation continued in a typical analytical manner. From the symptoms, dreams, and sexual behavior of his patient, Hippocrates decided that Perdicas suffered from a psychic disturbance due to a secret love for Phila. When he told his findings to the King, the latter reacted like psychoneurotics of today. He at first refused to believe it, and became quite excited over it, but within a few days he realized that Hippocrates was right; his symptoms disappeared, and he married the lady.

This version, of which I have presented a very small fragment, impressed me as too nice to be true, but it was not until I heard of it from two laymen, one of whom suspected that Freud might have gotten his whole psychoanalytic system from Hippocrates, that I began to investigate it. According to Baisette, who quotes from Dr. Edouard Auber: "All that is known of Hippocrates, his origin and his life, is found in Soranus of Ephesus, in Suidas and Histemachos, his biographers, or in Appolonius of Cittium, in Damascius and Palladius, who continued his work; or finally in the chronicles of antiquity, which swarmed with episodes and features of his life." Any effort to follow up these and other authorities carries one into a labyrinth of mythical uncertainties, from which it is hard to escape. Everything about Hippocrates is shrouded in mystery. Like so many others of equal, or similar, rank his very existence has been doubted. As to the Perdicas episode, from the numerous references to it one gains the impression that something like it must have happened. Those historians who speak of it all refer to Soranus, who was born in Cos the year Hippocrates is supposed to have died. Dr. Francis Clifton in "The Life of Hippocrates" gives the following account of this episode from Soranus: "He (Hippocrates), practised Physik in all parts of Greece, and was so much admired for his divine skill, as to be sent for publickly with Euryphon (a man superior to him in years) to Perdicas, King of Macedonia, who was then thought to be consumptive; but Hippocrates discovered it to be a disease of the mind. For upon the death of his father, Alexander, he fell in love with Phila, his father's mistress; which Hippocrates, easily discovering it by the mighty change her presence wrought upon him, acquainted him with, and so the disease was cured, and the King recovered."

This account is practically an exact reproduction from the Latin of Marco Fabio Calvo's *Hippocrates Vita de Sorani Historus*, published in 1525. Littré, Houdart and other historians express some doubts about this episode, which they claim actually occurred with slight modifications, but not to Hippocrates and Perdicas, but to Erasistratus, a pupil of Hippocrates and Antiochus, son of Selenus Nicator, King of Syria.¹⁰ Not to continue this subject any further, I feel that something like it might have happened to Hippocrates or to Erasistratus or to both. What is most interesting to us is that such a story was discussed before the Christian Era. In other words, psychogenesis and the rôle of sex in the neuroses (in the Freudian sense) were known some hundreds of years B. C. That Hippocrates might have treated Perdicas in the manner described by Baisette seems quite plausible when one studies the life and works of this great personage, especially as given by Baisette and other authors.¹¹ Baisette claims that the events described in his work are based on tradition and on the Hippocratic *Corpus*, that all words and citations are faithful reproductions of Hippocrates' works, that nothing has been added. Judging by this and other works one readily agrees with W. H. S. Jones, the scholarly translator of Hippocrates,¹² who states "The Hippocrates of tradition and the Hippocrates of the commentators may well be left buried in obscurity and uncertainty. What we do know, what must be our foundation stone, is that certain treatises in the *Corpus* are impressed with the marks of outstanding genius, who inherited much, and bequeathed much more. He stands for science and against superstition and hypothetical philosophy." To deny his existence in face of the fact that the Hippocratic oath has been impressed on every medical neophyte for over two thousand years would be as foolish as to deny the existence of Jesus whose daily prayer has been recited by Christians for about 1930 years.

If we cull from those who wrote about Hippocrates and from his own expressions and precepts, we may say that Hippocrates was the first physician who disregarded all the cant and superstition of his time and confined all his observations to the patient instead

¹⁰ Sigerist: "The Great Doctors," p. 49.

¹¹ Cf. Hans Mûch: *Hippocrates der Grosse*, Hippokrates-Verlag Stuttgart, 1926.

¹² Vol. I, p. XXX, of the Loeb Classics, Heinemann, 1922.

of to the symptoms. He was a painstaking recorder of all morbid manifestations, which he considered as a surface indication of a struggle between the patient and the disease. To quote Haggard, "Having recorded the symptoms of the patient, Hippocrates after wide experience was able to define and classify diseases. Thus, he founded the art of diagnosis and prognosis. But throughout all his work his attention was centered upon the patient, not merely upon his symptoms; he dealt with the man as well as with the disease. He kept in his practice the balanced relationship between science and art which was to be the distinguishing quality of all great clinicians in all ages."¹³ The above quotation, which I consider an excellent general summary of Hippocrates' achievements reminds us of the psychoanalytic approach to the problems of the neuroses. Freud, too, goes from the general to the specific. No two cases of hysteria or schizophrenia are alike, each case has its specific determinants. That the neurotic symptoms are the result of a struggle or a conflict between the patient's ego and something incompatible with it need not be repeated to anyone conversant with Freud's theories of the neuroses. We know, indeed, that the neurotic or psychotic struggle is in itself an effort at adjustment, or in the Hippocratic sense an effort to reestablish the former equilibrium or harmony.

According to Hippocrates there is a certain force, the *physis*; i.e., nature or constitution, which maintains the proper proportion of the mixture of the humors and any disturbance of this *physis* produces a disharmony; that is to say, a disease. Freud, too, lays stress on the constitutional factor in the production of the neurosis without however telling us the nature thereof. Moreover, psychoanalysis has often been designated more as an art than a science.

As far as I could find, Hippocrates was the first physician to recognize the brain as the most powerful organ of the human body. He said that when it is healthy it interprets for us all phenomena of the air. Eyes, ears, tongue, hands and feet act in accordance with the discernment of the brain. He stated that "to consciousness the brain is the messenger" and "the brain is the interpreter of consciousness."¹⁴ Such statements show that the father of

¹³ Haggard, H. W.: *Mystery, magic, and medicine*, p. 33. Doubleday, Doran and Co., New York, 1933.

¹⁴ Vol. 2, p. 179, of the Loeb Classics.

medicine was well versed in psychiatry and neurology despite the fact that he knew little, if any, anatomy and physiology.

It is also interesting to note that Hippocrates esteemed the dream as a valuable psychic phenomenon. In his works, he speaks of dreams and distinguishes dreams which are of no interest to the physician from those which indicate a definite disturbance of functions. In his excellent work on the epidemic diseases he describes typical anxiety dreams.

Hippocrates also recognized the importance of sex in health and disease. In his studies of reproduction, he frankly and expertly describes the functions of the sexual act, and various anomalies of the orgasm in both sexes. He also states that those women who have sexual intercourse enjoy better health than those who abstain from it. That he was well aware of the dangers of the transference mechanism in medical practice is shown by the fact that in the Hippocratic oath he enjoins on him who is entering the medical profession to keep himself from the seduction of men, children, and women, be they slaves or free persons. To my knowledge no teacher of medicine since Hippocrates has had the insight or perhaps the courage to deal with this subject until Freud, sensing its great force in medical practice and its importance in social life, frankly and expertly discusses it with his students.

From the material just cited, I hope that I have shown you that Hippocrates possessed the expert knowledge requisite for such an analysis as that described by Baisette. Whether or not someone else actually accomplished it is of little significance; *Si non è vero è ben trovato*, says the Italian. If it is not true, it is nevertheless a good story and shows that such ideas existed about 2000 years before Freud came on the scene.

Did Freud get his ideas from Hippocrates? As far as I recall, Hippocrates is mentioned only once in Freud's "Interpretation of Dreams." I am sure that Freud never made any special study of Hippocrates. That there is a striking resemblance between Freud's approach to the neuroses and Hippocrates' approach to medicine in general only demonstrates the popular saying that great minds run in the same, or might I say similar, channels. Great personages owe their greatness to their independence. They do not have to copy from others. To be sure "everything has already been here, there is nothing new under the sun" (in the words of

Koheleth). New ideas are nothing but new combination and permutations of old ideas bolstered occasionally by some new experience. That Freud should have become interested in the subjects of constitution, dreams, and sex which similarly absorbed Hippocrates and probably many others, thousands of years before is not so strange when we consider that Freud was the first physician to give of his time unstintingly to his patients, he is a great observer, a great genius who has had the courage to record what he actually found, which even his opponents must now concede.

There is much more that I could tell about the resemblance of Freudism to Hippocratism, but in the memorable words of the Father of Medicine "*Ars longa, vita brevis.*"

THE NEYMANN-KOHLSTEDT DIAGNOSTIC TEST FOR INTROVERSION-EXTROVERSION AS APPLIED TO DELINQUENTS.

By M. J. PESCOR, M. D.,

Assistant Surgeon (R.) United States Public Health Service.

This study was initiated to determine the value of the Neymann-Kohlstedt Diagnostic Test for Introversion-Extroversion as an aid in eliciting introversive and extroversive traits among delinquents. Such an instrument, if proven efficient, not only saves time in conducting an examination, but also systematizes the findings, thereby facilitating statistical research.

The test comprises 50 statements, each followed by the words "Yes" and "No." The subject is instructed to note his personal like or dislike for each particular statement by underlining either "Yes" or "No," as the case may be. Extrovert responses are recorded as plus and introvert responses as minus. The final score is obtained by the algebraic addition of the plus and minus answers. For a fuller descriptive account the reader is referred to the article written by the originators of the test, and appearing in the *Journal of Abnormal and Social Psychology*.¹

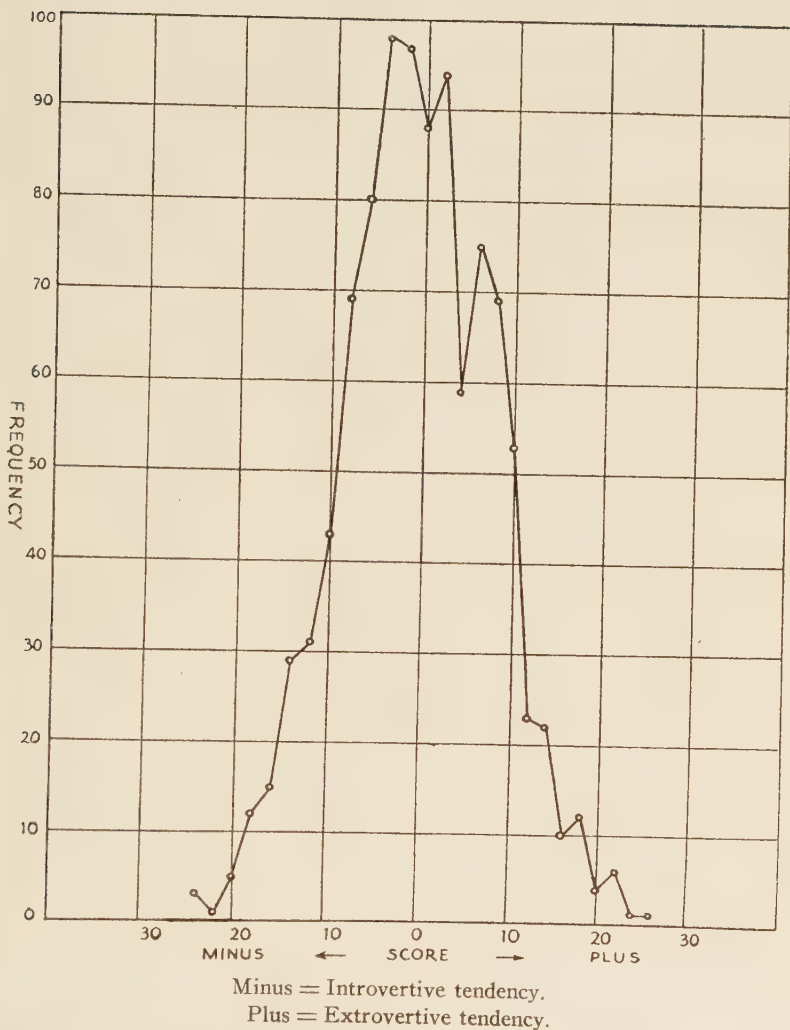
The material consists of examinations made on 1000 individuals admitted to the United States Northeastern Penitentiary from February 20, 1934, to July 15, 1935. The group is fairly representative of the general prison population, excluding only those who were unable to take the test because of language difficulty, unwillingness to cooperate or inability to comprehend the directions because of low intelligence. In all 464 individuals were thus excluded.

The selected inmates were drawn almost entirely from the northeastern section of the United States, including all of New England, New York, New Jersey, Delaware, Maryland, Pennsylvania and part of Ohio and West Virginia. They range in ages from 18 to 76, with an average age of 33.06. Nordics comprise 45.5 per cent of the group, Latins 21 per cent, Semitics 20.5 per cent, and the remaining 13 per cent include Slavs, negroes and miscellaneous

rates. From an educational standpoint 57.5 per cent attended grade school only, 34 per cent attended high school and 8.5 per cent attended college. Unskilled laborers constitute 40 per cent of the group, skilled 27.5 per cent and clerical or professional 32.5 per cent. Violation of the National Currency Act (passing and possession of counterfeit money) claimed the most victims, 36.3 per cent; violation of the Internal Revenue Act (possession of untaxed liquor) is next in order, accounting for 16.6 per cent of the group. Violation of the Harrison Act (narcotic law) snared 8.4 per cent, and violation of the Dyer Act (transporting stolen automobiles from State to State) 4.9 per cent. The remaining 33.8 per cent of the group were convicted of sundry offenses, such as mail fraud, robbery, forgery, embezzlement, etc. Those convicted for the first time account for 58.5 per cent of the group, and recidivists for 41.5 per cent.

As a primary procedure, a frequency curve depicting the distribution of scores made by the thousand subjects was plotted. This is presented in Graph I. It will be noted that the curve shows practically a normal bell-shaped type of distribution with the median at zero, the 10 percentile at minus ten and the 90 percentile at plus ten. This is contrary to the findings in the original work of Neymann and Kohlstedt, who demonstrated a bimodal frequency curve for both psychotic and normal individuals. In other words, their subjects tended to group themselves "into a predominance of introvertive and extrovertive traits with comparatively few borderline cases."¹ Neymann, in a subsequent study² again reported a bimodal curve of distribution. The delinquents, on the other hand, do not differentiate themselves in such a manner, but tend to fall into the central or borderline zone. The significance of this finding is problematical. It would appear that neutroverts are more apt to get into conflicts with the law than either extroverts or introverts.

The next step was to determine the relative likes and dislikes of the thousand inmates by compiling their reactions to the fifty statements contained in the test. The majority, that is 60 per cent or more, like to be calm and collected, to think a great deal, to plan out work before beginning it, to be exceedingly careful in meeting people, to avoid trouble rather than face it, to keep quiet when out in company, to think a great deal before deciding any-



GRAPH I.—Distribution of scores made by 1000 inmates of the United States Northeastern Penitentiary on the Neymann-Kohlstedt diagnostic test for introversion-extroversion.

thing, to spend a vacation at a quiet place rather than a lively resort, to meditate and think about themselves, to distrust people they have just met until they get better acquainted, to be able to express their keenest feelings, to work in the presence of many people, to think of life in terms of pleasure, to have a great deal of confidence in others, to have people watch them do things that they do very well, and to study others rather than themselves.

The majority, 60 per cent or more, do not like to attend social gatherings just to be with people, to act on suggestions quickly rather than stopping to think, to quit a tiresome task, to have people watch them, to speak in public, to be leaders at a social affair, to change their opinions easily when formed, to change from one type of work to another frequently, to act on the spur of the moment, to accept suggestions rather than working them out for themselves, to keep a personal diary, to rewrite social letters, to believe that rumors are important, to let themselves go when angry, to do the same kind of work all the time, to indulge in quiet rather than exciting amusements, to read about rather than do a thing, to do the things they day-dream about, to be by themselves a great deal, to dream or think about the future, or to indulge in reverie.

Two groups were next selected for a more intensive comparative study. The first consisted of the 132 extrovert individuals who made a score of plus 10 or more on the test; and the second was composed of the 139 introvert individuals who made a score of minus 10 or more (minus). Comparisons were made on the basis of age, race, mental status, education, occupation, type of crime committed, recidivism, disrupted homes, that is death of one or both parents or separation of parents, body types, intelligence, emotional status as determined by the Woodworth Personal Data Sheet ³ and also by clinical observation, sick line attendance, disciplinary action and finally psychiatric classification.

A disappointing similarity between the two groups was disclosed. The average age was found to be 33.4 years for the introverts and 32.8 years for the extroverts. Racial origin showed some difference in that there were twice as many of southern European descent in the introvert group as there were in the extrovert, and conversely twice as many of Semitic origin in the extrovert class as there were in the introvert. Other races were fairly equally distributed. Single men indicated a greater leaning toward extroversion than married

men by a margin of 10.3 per cent. The disparity is too slight to draw the obvious inference.

Education and occupation revealed no significant dissimilarities of distribution. Likewise, the type of crime committed apparently has very little relationship to introversion or extroversion except that 7.2 per cent of the introverts were convicted of forging federal obligations, but none of the extroverts were convicted of the same crime. Incidentally, the introvert forgers constituted 76.9 per cent of the total number of forgers in the institution. Recidivists were about equally distributed between the two groups. About 6 per cent more introverts than extroverts gave a history of homes broken up by death, divorce or separation of parents.

Judging from the results body type does not condition introversive or extroversive tendencies. Only 5.7 per cent more of the individuals with a pyknic body build appeared in the extrovert group than in the introvert group. The number of asthenic individuals was practically equal in the two groups, and the athletic type favored the introvert class by a margin of 6.1 per cent. Intelligence apparently has very little influence, the extroverts having an average mental age of 15 years 2 months and the introverts 15 years 3 months. This agrees with Neymann's conclusion, "intelligence and introversion do not coincide."²

Emotional status as determined by the Woodworth Personal Data Sheet disclosed that extroverts responded with an average of 12.9 incorrect answers as against 13.5 for the introverts. This is somewhat higher than the average of 10.8 incorrect responses given by the general institutional population, indicating a slight but equal tendency toward emotional instability among extroverts and introverts. Observational impressions yielded an almost equal number of emotionally unstable individuals in the two groups. Sick line attendance, which is often a good indicator of the emotional status of an individual revealed practically no difference between the two classes, but when compared with the general average attendance of all inmates, it was found that introverts and extroverts appeared on sick line twice as frequently as the average prisoner.

According to disciplinary reports, which is another criterion of adjustment, twice as many extroverts were subjected to disciplinary measures as there were introverts. Compared with the general average extroverts showed a greater propensity for violating the

rules of the institution by a margin of 11.3 per cent. On the other hand introverts fell below the average by 2.4 per cent. This is a logical finding, since an introvert tends to mind his own affairs, whereas the typical extrovert does not believe in the old adage that "silence is a virtue" in prison as well as elsewhere.

The psychiatric classification failed to disclose any marked differentiation between the two groups. The diagnosis of psychopathic personality occurred 9 per cent more frequently among extroverts than among introverts, and the diagnosis of psychoneurosis occurred 4 per cent less frequently. Both groups, however, revealed a greater proportion of individuals classified as psychopathic personalities than the general average for the inmate population, the extroverts to the extent of 15 per cent above the average and the introverts 6 per cent above the average. The feeble-minded were, for the most part, excluded from this study because of inability to cooperate on the test, hence no statistics are available. There were no frankly psychotic individuals in either group.

An effort was made to establish the reliability of the test by reclassifying the two special groups on the basis of history, clinical observation and general behavior in the institution. In the extrovert group the test results were confirmed in 78.2 per cent of the cases; considered doubtful in 6.1 per cent, and reversed in 15.7 per cent, *i. e.*, 15.7 per cent were adjudged as definite introverts. In the introvert group the findings were confirmed in 59 per cent of the cases; considered doubtful in 19.7 per cent, and reversed in 21.3 per cent; *i. e.*, 21.3 per cent were classified as definite extroverts. It would appear that the test is more selective for extroverts than for introverts.

As a second procedure 100 individuals were retested and their original scores correlated against their new scores. The reliability coefficient, stepped up by the Brown formula ($r_2 = \frac{2r_1}{1+r}$), turned out to be .63, with a probable error of .06. It seems that the score is considerably influenced by the emotional state of the individual at the time he is undergoing the examination, and therefore does not satisfactorily uncover his basic temperament. Finally, the scores made on the first half of the test were correlated against the scores made on the second half, utilizing the entire 1000 cases examined. By this procedure the coefficient of reliability was found

to be .19 with a probable error of .03, indicating that the test is not a uniform measure for whatever it is intended to measure. Practically every individual tended to give more extrovertive responses to the first 25 statements than he did to the second 25 statements.

CONCLUSIONS.

1. Delinquents tend to group themselves in the central or neutral zone, according to test results, in contrast to the normal individuals examined by Neymann and Kohlstedt, who tend to show either marked extrovertive or introvertive traits.

2. A comparative study of delinquent extroverts and introverts from numerous angles failed to reveal any startling differences between the two groups.

3. Judging from clinical observation the Neymann-Kohlstedt Introversion-Extroversion Test is more selective for extroverts than for introverts.

4. The reliability coefficient as determined by the retest method was found to be .63 with a probable error of .06, and by the half against half method .19 with a probable error of .03.

5. It would appear that the score is considerably influenced by transitory moods which obscure basic temperamental traits.

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FUNDAMENTAL EFFECTS OF EPILEPTOGENOUS AGENTS UPON THE CENTRAL NERVOUS SYSTEM.

BY E. A. SPIEGEL AND M. SPIEGEL-ADOLF.¹

The experiments reported in this paper are part of systematic studies concerned with the fundamental mechanism in convulsive disorders. This mechanism must be sought in the excitable elements of the central nervous system, the nerve cells. According to the modern physicochemical theories, excitation is brought about by changes of ion concentration on semipermeable surface layers (Ostwald,² Nernst³) that induce a transitory increase in permeability of the cell surface (Höber,⁴ Lillie⁵). The excitability of the cells depends, therefore, largely on the physicochemical state of their surface layers. Agents that further the increase of permeability associated with excitation will increase the excitability as long as they do not injure the cell surfaces thus far, that ion concentrations can no more develop. This is, for example, shown in the electrotonic state caused by a direct current that flows through a nerve. The excitability is increased on the cathode where the surface layers become more permeable, while on the anode a decrease of excitability as well as of permeability is found (Ebbecke⁶).

¹ From the Department of Experimental Neurology and the Department of Colloid Chemistry, D. J. McCarthy Foundation, Temple University School of Medicine, Philadelphia, Pa.

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² Ostwald, W.: *Zschr. f. physik. Chemie*, 6, H. 1, 1890.

³ Nernst, W.: *Pflueger's Arch. ges. Physiol.*, 122: 275, 1908; 123: 454, 1908.

⁴ Höber, R.: *Physik. Chemie d. Zelle u. Gewebe.*, 6th ed., 1926.

⁵ Lillie, R.: *Protoplasmic action and nervous action*. University of Chicago Press, 1923.

⁶ Ebbecke, U.: *Pflueger's Arch. ges. Physiol.*, 190: 250, 1921; 195: 300-324, 555, 1922; 203: 336, 1924.

Considering these relationships, it was outlined by one of us⁷ at a former meeting of this society (1930) that the hyperexcitability of the cerebral cortex and the abnormal form of its reactions found in convulsive disorders may be due to anomalies in the permeability of the surface layers of the nerve cells.⁸ This conception, although in agreement with the view of Georgi,⁹ Syz,¹⁰ that the metabolic changes found in epilepsy act finally on the cell membranes, was expressed as a working hypothesis only. One has to bear in mind that experiments about the effect of various agents, such as acids, alkalis, etc., on other organs cannot be applied to the central nervous system without further proof because the brain, on account of its high lipoid content, may react differently from other organs. It seemed therefore desirable to study by systematic experiments the effect of epileptogenous and anticonvulsant agents upon the permeability of brain tissue.

As direct measurements of the cell permeability for electrolytes cannot thus far be applied to the cells of the central nervous system, it seemed necessary to have recourse to an indirect method, using the fact that polarization phenomena occur on semipermeable membranes as well as on animal tissues with semipermeable cell surface films. If a direct current flows through the skin, a muscle, nerve, or the brain, a higher resistance is measured than when alternating current is used. This is explained by the assumption that

⁷ Spiegel, E.: Am. Psychiatric Assoc., Section on Convulsive Disorders, May 5, 1930. Am. J. Psychiat., 87: 595, Jan. 1931.

⁸ J. McQuarrie and his associates assume also an abnormal permeability of the nerve cells in epileptics. This conception is first found in his papers on epilepsy read in 1931 (April 15-17, 1931), published in Am. Jour. Dis. Child., 42: 720, 1931, May 4, 1931, and J. Clinic Investigation, 10: 915, 1931, while in his former papers no such theory could be found (Am. J. Dis. Child., 38: 451, 1929. Research Assoc. Nerv. and Mental Disease, 7: 623, 1929-31). The observation that the ratio of lecithin to cholesterol is increased in the blood during periods of convulsions permits no conclusions as to the ratio of these lipoids in the cells themselves; furthermore the author states himself that he did not rule out that his findings in the blood were the effect of the convulsions. It seems therefore not justified to infer from these findings, that the permeability of the nerve cells was increased preceding the convulsions.

⁹ Georgi, F.: Zeitschr. f. d. ges. Neurol., 106: 751, 1926.

¹⁰ Syz, H. C.: Schweiz. Arch. f. Neur. and Psych., 21: 321, 1927. J. of Pharmacol. and Exp. Ther., 30: 1, 1926.

the ions carrying the current are partly accumulated at semi-permeable cell films, and that an electromotive force of opposite direction is in this way induced. The less permeable these films are, the larger opposing forces will develop by polarization. On the contrary, an increase in permeability of the cell membranes will diminish the accumulation of ions and the development of polarization. Thus one can use the measurement of polarizability, for instance, the measurement of the polarization capacity,¹¹ as pointed out by Gildemeister,¹² as an indirect method for measurement of permeability.¹³

In order to measure polarizability and thus indirectly permeability, one can also use the following fact. Animal tissues show not only a larger resistance toward direct current than toward alternating current, but also differences of resistance on conduction of alternating currents of various frequencies in that the conductivity increases with the increasing frequency. (On the frog's and human skin, Gildemeister,¹⁴ Einthoven and Bijtel¹⁵; on frog's nerves, Krüger,¹⁶ Lullies¹⁷). We found the same on the brain.

The difference between the conductivity at a certain high (K_h) and at a certain low frequency (K_l) expressed in percentage of the conductivity at the low frequency (Δ) may be briefly called "polarization-index." $\Delta = \frac{K_h - K_l}{K_l} \times 100$. Usually a frequency of 4860 and 560 cycles respectively was used. A drop of Δ indicates lowered polarizability and thus increased permeability of the cell surfaces. A rise of Δ indicates an increase in polarizability and consequently also in density of the surfaces.¹⁸

¹¹Films with selective ionic permeability may show a capacity ("polarization-capacity") due to the accumulation of ions and to the development of an electric double layer that is charged and discharged by the current. (See Krueger, F. *Zeitschr. f. physik. Chemie*, 45: 1, 1903.)

¹²Gildemeister, M.: *Handb. d. norm. and pathol. Physiol.*, 8: 657, 1928.

¹³The importance of the Helmholtz double layer and of the degree of dispersion of the colloid particles will be discussed in another paper.

¹⁴Gildemeister, M.: *Pfluegers Arch. ges. Physiol.*, 176: 84, 1919.

¹⁵Einthoven and Bijtel: *Ibid.*, 198: 439, 1923.

¹⁶Krüger, R.: *Ibid.*, 219: 66, 1928.

¹⁷Lullies, H.: *Ibid.*, 225: 69, 1930.

¹⁸Upon a similar principle the method to measure the thickness of the plasma membrane is based. By this method the difference between the impe-

In order to analyze to some degree the underlying chemical and colloid chemical conditions, in a previous paper various artificial membranes were studied.¹⁹ When parchment, collodium membranes,²⁰ 30 per cent gelatine membranes hardened in formaldehyde, 30 per cent gelatine membranes containing 2.5 per cent pseudoglobulin were measured, Δ did not exceed 0.4 per cent. With such membranes also a sharp minimum could be easily obtained on the Wheatstone bridge without the addition of condensers. On animal membranes, however, *e. g.*, a frog's skin, a Δ of more than 20 per cent was observed with the same frequencies of the alternating currents (6890 and 560 cycles respectively), and considerable capacities had to be employed in order to get a sharp minimum. These qualities were imitated by lipid membranes containing the lipid in fine dispersion (prepared from collodium—ether solutions containing from .2-5 per cent of lecithin or cephalin). These experiments showed the important part played by the physicochemical structure in the genesis of these polarization phenomena.

In further (unpublished) experiments it could also be quantitatively shown by direct measurements that membranes with higher Δ (higher polarizability) have a lower permeability for electrolytes. Starting from these experiments on artificial membranes we used the measurement of Δ to determine the polarizability of brain tissue *in vitro* and *in vivo* under the influence of various experimental procedures.

In the experiments reported in this paper the effect of an important group of epileptogenous factors upon the polarizability

dance at low frequencies and at frequencies over one million is determined. (Philippon. Bull. Ac. Roy. Belg., 7: 389, 1921. McClendon, J. F.: *Protoplasma*, 3: 7, 1927.)

The present series of experiments is primarily not concerned with the thickness of the plasma membranes but only with changes of the membranes in polarizability and permeability respectively due to various experimental procedures. While the measurement of the impedance at frequencies over one million requires quite a complicated apparatus, it was sufficient for our purpose to limit the measurement to audible frequencies. Thus we could build an outfit that is simple enough to be portable and to be used also during operations on the human brain.

¹⁹ Spiegel-Adolf, M., and Spiegel E.: *Proc. Soc. Exp. Biol. & Med.*, 32: 139, 1934.

²⁰ In further experiments it was found that collodium membranes may show a Δ , if specially treated.

of the brain was studied, namely of changes in the state of hydration. Increase of the volume of the brain due to abnormal intake of water by the brain tissue may be observed in a number of pathologic states that are conducive to the production of convulsions. It is found, for instance, after traumatic injuries, in the neighborhood of tumors, in uremia, alcohol intoxication, water intoxication due to forced administration of excessive quantities of water (Rowntree²¹), finally, in certain psychoses. In most of these states one has not to do purely with increased hydration of the structured elements (Reichardt's Hirnschwellung²²) but with the combined effect of increase of interstitial fluid (edema) and of increased hydration of the cellular colloids. The importance of these factors in the pathogeny of convulsive disorders is also indicated by the reports of Fay²³ and others that measures subtracting water from the body tissue reservoirs have a beneficial effect upon certain cases of epilepsy.

Method.—A Wheatstone bridge is supplied by an oscillator with alternating currents of various frequencies (560 to 9000 cycles); usually the measurements were made at 560 and 4860 Hertz (cycles per second). In order to get this range of frequencies the oscillator described by Jones and Joseph²⁴ was somewhat modified, particularly by addition of small capacities. It was enclosed in a grounded iron shield and placed at a distance of 5 m. from the bridge. The lead wires from the oscillator to the bridge were also surrounded by a grounded metallic sheath until close to the bridge according to the directions of Jones and Joseph. The sensitivity of the detector was increased by insertion of an amplifier (General Radio Co.—Type 514 A) between the bridge and the telephone. In order to obtain a sharp minimum a decade condenser and a variable air condenser were connected in parallel with the resistance box. Thus not only the conductivity and the polarization index, but also the polarization capacity could be determined. Since the condensers are here connected in parallel with the resistance box,

²¹ Rowntree, L. G.: J. Pharmacol. and Exper. Ther., 29: 135, 1926.

²² Reichardt: Zschr. ges. Neur. and Psych. Ref., 3: 1, 1911; Allg. Zschr. f. Psychiatrie, 75: 34, 1910.

²³ Fay, T.: Am. J. Psychiat., 85: 783, 1929; Res. Ass. Nerv. and Ment. Dis., 7: 592, 1929-31; Arch. Neur. and Psych., 23: 920, 1930; J. Nerv. and Ment. Dis., 71: 481, 1930.

²⁴ Jones, G., and Joseph, R. C.: J. Am. Chem. Soc., 50: 1049, 1928.

an increase in capacity indicates an increase in polarization. The use of proper electrodes proved to be particularly important. After numerous experiments with various types (especially Ag-AgCl electrodes), we found that platinum electrodes that were coated with black of platinum and then heated to red gave the most satisfactory results. First small triangular or ovoid (5 mm. in length, 4 mm. in width) plates, later platinum wires of 1 mm. diameter were used. The electrodes were fused in thin glass tubes that contained also the lead wires. It was finally decided to use 6-10 cm. long straight platinum wires that were fused in glass tubes so that on both sides only the ends of the wires remained bare. The bare end that was inserted into the brain was 6 mm long. The other end could be easily connected with and disconnected from the bridge by using small alligator clamps on the end of the bridge connections. The glass tubes containing the electrodes were fastened in a holder so that a fixed (constant) distance of the electrode wires of 9 mm. was secured. The holder was provided with a ball and socket joint that facilitated to adapt the position of the electrode to the surface of the brain. It must be emphasized that the electrodes had to be heated to red before each experiment, and that every day control measurements were made before the actual experiments, to ascertain whether the electrodes themselves gave a difference in conductivity at high and low frequencies, when tested in salt solutions (*e. g.*, $\frac{n}{100}$ KCl). Such differences occur if the electrodes are contaminated by small amounts of organic matter. If this difference can not be abolished or sufficiently reduced (to, at most, 1-2 millimeter²⁵ on the Wheatstone bridge) by heating the electrodes, they have to be recoated with black of platinum. The experiments were performed on 50 brains (of calves, cats, guinea pigs and rabbits). With the exception of the calves' brains that could not be measured before at least two hours after death, the organ was examined as soon as possible post mortem. The measurements usually were made on the lateral surface of the cerebral hemispheres after the brain was symmetrically divided. Each hemisphere was put for the measure-

²⁵ If electrodes showing such differences are used, one must subtract the Δ given by the electrodes in solutions from the Δ measured on the brain. Yet we avoided as much as possible the use of such electrodes.

ment, usually upon its medial surface, in a small glass dish, that had on its ground a layer of paraffine with a shallow groove conforming to the medial surface of the hemisphere. The dish was covered with wet filter paper that had an opening for the electrodes. As a rule, the measurements were made, if not otherwise indicated, at 39° C. in an incubator that contained the electrodes with their holder as well as the dishes with the specimens under measurements. After the first measurement each hemisphere was dropped in a covered beaker that contained 50 or 100 cc. of the solution to be studied and was also kept in the incubator at 39° C. if not otherwise indicated. At intervals the brain was taken from the solution, its surface was dried by filter paper and its polarization index was redetermined.

In the experiments on the cerebral hemispheres of living animals (usually cats) two small trephine holes were made corresponding to each electrode or one large opening was produced, the diameter of which was somewhat larger than the distance of the electrodes. In the latter case it was necessary to keep the cortex moist by dripping warm saline solution in the intervals between the measurements. To protect it from cooling down and becoming dry a plastilin cap was made that fitted over the gap in the cranium and could be easily removed and replaced. The measurements were made under ether or dial anesthesia. For measurements on the brain stem the cats were decerebrated by a transverse section cranially to the midbrain after ligation of both carotid arteries, the hemispheres and the optic thalamus were extirpated, eventually also the tentorium was removed and clips were placed on the stumps of the internal carotid arteries. In these decerebrated animals it is of course important not only to protect the exposed parts of the brain from cooling down and becoming dry, but also to keep the animal's temperature constant (*e. g.*, by electric lamps). Special care was taken to fix rigidly the head as well as the electrodes, because slight displacements of the electrodes in the brain may induce errors in the measurements. The bare parts of the electrodes must be completely inserted into the brain, so that the glass tubes in which the electrodes are fused remain in close touch with the surface of the brain. If the electrodes are incompletely inserted, the measurements are unreliable and may become impossible, because the length of the part of the electrodes reaching

into the brain varies with the respiratory movements of the surface of the organ. The animal board was electrically insulated by placing its feet in glass cups.

RESULTS AND COMMENT.

We have produced swelling *in vitro* as well as *in vivo*. If one places the brain in hypotonic salt solutions or in distilled water, it increases in weight and volume. This change is associated with a marked decrease of the polarization-index. It must be emphasized, however, that Δ decreases already in physiologic saline solution. Measurements on 10 brains of guinea pigs and cats respectively gave per hour an average decrease of 10.2 per cent of the initial value. This decrease is partly due to postmortem changes, partly due to the fact that a slight swelling of the brain occurs even in the so called physiologic saline solution (Vaudervach²⁶). This decrease of Δ is less marked in Ringer solution than in .9 per cent NaCl solution. In distilled water the curve of the polarization index shows a much steeper slope than in the saline solution. (Table I.) A similar or sometimes still steeper decrease of Δ than observed in distilled water is induced by alkali, even if the alkali solution is made isotonic or slightly hypertonic by preparing the dilution with saline solution. (Table II.) Such a steep slope of the Δ curve as observed in alkali solution is as a rule missed in acids. The acids diminish the polarizability of the brain usually not more or only slightly more than does physiologic saline solution. (Table III.) A distinct decrease of Δ was only observed in sulfuric acid. The decrease in a mixture of hydrochloric acid and saline solution did not exceed or was even smaller than that observed in saline solutions. We are here, of course, particularly interested in the effect of acids occurring in the animal organism. Saline solution acidified with lactic or phosphoric acid did not produce a more marked or produced even a slighter diminution of Δ than did pure saline solution. CO₂ conducted through a .9 per cent NaCl solution was somewhat more effective in producing a decrease of Δ ; but the change remained within the range of the effects of .9 per cent NaCl solution.

²⁶ Vaudervach, F.: Arch. internat. de physiol., 38: 278, 1934.

TABLE I.*
DISTILLED WATER.

	Initial value.			After swelling.			Decrease of Δ	
	Δ	Conductance (560 Hertz)	Capacity (560 Hertz)	Δ	Conductance (560 Hertz)	Capacity (560 Hertz)	In per cent per hour.	
Guinea pig No. 41 37° C.	15.0 (26')	5.510×10^{-4}	—	12.5 (82')	4.818×10^{-4}	—	2.5	16.5
Guinea pig No. 45 37° C.	13.4 (21')	6.077×10^{-4}	.025 microfarad	10.5 (70')	4.671×10^{-4}	.018 microfarad	2.9	25.9
Cat No. 48 38° C.	14.3 (72')	9.085×10^{-4}	.025	8.3 (198')	7.800×10^{-4}	.022	6.0	21.4
Guinea pig No. 84 39° C.	11.1 (22')	7.196×10^{-4}	.020	9.4 (100')	6.543×10^{-4}	.019	1.7	11.4
Guinea pig No. 89	13.9 (28')	7.232×10^{-4}	.023	12.0 (108')	6.176×10^{-4}	.020	1.9	10.3
Average.....								17.1

* Explanation to Tables I-III: The figures in parenthesis mean minutes after death.

TABLE II.
ALKALI.

	Initial value.			After swelling in alkali.			Decrease of Δ		Decrease in per cent per hour on opposite hemisphere in .9 per cent NaCl.
	Δ	Conductance (560 Hertz)	Capacity (560 Hertz)	Δ	Conductance (560 Hertz)	Capacity (560 Hertz)		In per cent per hour.	
n/100 NaOH; .9 per cent NaCl Guinea pig No. 28 37.2° C.	11.5 (41')	8.64×10^{-4}	—	5.6 (264')	1.72×10^{-3}	—	5.9	14.0	4.1
n/100 NaOH; .9 per cent NaCl Guinea pig No. 29 37.0° C.	12.8 (32')	6.95×10^{-4}	—	7.5 (155')	1.302×10^{-3}	—	5.3	20.4	—
n/100 NH_4OH ; .9 per cent NaCl Guinea pig No. 34 38° C.	12.9 (18')	6.949×10^{-4}	—	10.5 (90')	8.117×10^{-4}	—	2.4	16.0	13.5
n/1000 NaOH .9 per cent NaCl Guinea pig No. 35 38° C.	16.0 (25')	8.018×10^{-4}	—	13.6 (82') 11.9 (155')	7.953×10^{-4} 8.215×10^{-4}	—	2.4	15.0	13.7
n/100 NaOH; .9 per cent NaCl Guinea pig No. 36 37° C.	12.5 (17')	7.76×10^{-4}	—	8.6 (95')	1.475×10^{-3}	—	3.9	24.4	5.0
n/100 NaOH Guinea pig No. 38 37° C.	15.4 (22')	6.313×10^{-4}	.035 microfarad.	11.1 (69')	6.848×10^{-4}	.026 microfarad.	4.3	36.8	NaOH on both sides applied.

TABLE II.—CONTINUED.
ALKALI.

	Initial value.			After swelling in alkali.			Decrease of Δ		Decrease in per cent per hour on opposite hemisphere in .9 per cent NaCl.
	Δ	Conductance (560 Hertz)	Capacity (560 Hertz)	Δ	Conductance (560 Hertz)	Capacity (560 Hertz)	In per cent per hour.		
n/100 NaOH Guinea pig No. 39 37° C.	13.9 (16')	6.064×10^{-4}	.025	10.4 (72')	7.007×10^{-4}	.023	3.5	25.0	NaOH on both sides applied
n/100 NaOH Guinea pig No. 53 37.5° C.	14.1 (25')	6.278×10^{-4}	.02	11.4 (115')	5.796×10^{-4}	.02	2.7	12.9	NaOH on both sides applied.
n/100 NaOH Cat No. 56 38° C.	11.2 (35')	6.380×10^{-4} (680 Hertz)	.012	8.3 (150')	7.518×10^{-4} (680 Hertz)	.011	2.9	13.8	NaOH on both sides applied.
n/100 NaOH Guinea pig No. 87 39° C.	14.3 (20')	7.181×10^{-4}	.023	12.4 (95')	6.207×10^{-4}	.022	1.9	10.9	NaOH on both sides applied.
Average							18.92		

TABLE III.
ACIDS.

	Initial value.		After action of acid.		Decrease of Δ		Decrease in per cent per hour on opposite hemisphere in .9 per cent NaCl.
	Δ	Conductance (560 Hertz)	Δ	Conductance (560 Hertz)	Δ	In per cent per hour.	
n/100 HCl; .9 per cent NaCl Cat No. 21 36° C.	9.4 (127')	1.176×10^{-3}	8.5 (180')	1.344×10^{-3}	.9	9.5	—
n/100 H ₂ SO ₄ ; .9 per cent NaCl Guinea pig No. 82 38.5° C.	13.5 (29')	6.667×10^{-4}	9.6 (100')	9.011×10^{-4}	3.9	24.3	13.1
n/100 lactic acid; .9 per cent NaCl Guinea pig No. 81 39° C.	13.0 (19')	7.605×10^{-4}	11.8 (172')	5.961×10^{-4}	1.2	3.7	7.3
m/100 H ₃ PO ₄ ; .9 per cent NaCl Cat No. 83 39° C.	11.4 (32')	1.000×10^{-3}	11.3 (94')	1.024×10^{-3}	.1	0.8	9.6
CO ₂ conducted through .9 per cent NaCl Guinea pig No. 93 38.5° C.	12.4 (18')	7.698×10^{-4}	11.2 (85')	8.570×10^{-4}	1.2	9.9	8.5

In interpreting these observations, one is confronted with the question as to how far the ganglion cells play a part in the measurement of brain polarization and in changes of this value. The Δ of regions that contain numerous ganglion cells (grey matter of the cortex and the caudate nucleus), was therefore, compared with the Δ of regions without ganglion cells (white matter). Calves' brains were cut in discs of 1-2 cm. thickness by frontal sections so that the Δ of the cortex as well as of the white matter and of the subcortical ganglia could be determined on one and the same disc under comparable conditions (disc placed in a moist chamber in an incubator at constant temperature). These measurements showed that Δ is on an average in the cortex by 23 per cent, in the caudate nucleus by 55 per cent higher than in the white matter. This can not be due to the better blood supply nor to the higher water content of the grey matter. There remains rather little blood in the brain after death. But above all one has to consider that a part richer in blood or in interstitial fluid should have less structured elements per cubic millimeter and give the current also a better opportunity to flow between or around these structures; thus it should have a lower Δ , while a higher Δ was found in the grey matter. The inference that the higher Δ of the grey matter indicates a greater amount of polarizable films in the grey matter, is corroborated by the measurement of the polarization capacitance. This value was higher in the grey matter than in the white matter; *e. g.*, 2 hours, 28 minutes after death caudate nucleus at 560 Hertz .028 microfarad, centrum semiovale .023 microfarad. It is also quite improbable that the differences found between the Δ of the grey and that of the white matter are due to the differences in the development of postmortem changes. It is true that Δ diminishes several hours after death. Yet it is known that nerve fibers forming the white matter survive longer, remain longer excitable and are more resistant than the ganglion cells in the grey matter. Postmortem changes should therefore produce differences between Δ of the grey and white matter in the opposite direction than found. One may, therefore, infer that the higher value of Δ found in the grey matter as compared with the white matter is due to the structural differences of these two regions, indicating that the surfaces of the ganglion cells play quite an important part in the polarization phenomena under study.

The objection could be raised that the decrease of the polarization index observed after the brain has been immersed in distilled water or in alkali solution may be due to changes in conductivity in the intercellular spaces. The decrease of Δ , however, is independent of the changes in conductivity, and was observed with increasing conductivity (swelling in alkali-NaCl solution) as well as with decreasing conductivity (swelling in distilled water). In analyzing this question, it is also important to compare the effect of acids and that of alkalis. The entrance of an acid-NaCl-mixture into the intercellular spaces should improve the conduction of the current in the intercellular spaces at least as well as an equimolecular NaOH-NaCl mixture. Yet the diminution of Δ was much more marked under the influence of alkali that induced marked swelling than under that of acids. These facts seem to refute the above mentioned objection, and it seems therefore justified to conclude that the decrease of the polarizability indicates a change of the surface layers of the structured elements, particularly of the cells. Such a change can be well understood if one remembers that swelling loosens the structure of a membrane by intake of water between its molecules or micelles (Katz²⁷). By such a structural change in the surface layers of the cells an increase of the permeability and consequently a decrease of polarizability will be easily produced.

If one produces first a swelling of the brain and consequently a decrease of Δ by alkali, and then places the brain in acids, the further decrease of the polarization index is inhibited or even a partial restoration of the former value may be produced. Acetic acid and tricarballic acid were in this respect more effective than hydrochloric acid. (Table IV.)

The particular effects of acids upon the polarizability of the brain can be understood, if one remembers that acids, contrary to their influence upon other organs, do not further the swelling of the central nervous system or may even inhibit the swelling as shown by I. Bauer²⁸ by gravimetric measurements in post mortem experiments. On nerve fibers E. Spiegel²⁹ used the fact that swelling lowers or destroys the birefringence of the myelin sheaths

²⁷ Katz, I. R.: *Erg. d. exakt. Naturwissensch.*, 3: 316, 1924.

²⁸ Bauer, I.: *Arb. Neurol. Instit. Universit. Wien*, 19: 87, 1911.

²⁹ Spiegel, E.: *Pfluegers Arch. ges. Physiol.*, 192: 225, 1921.

TABLE IV.
EFFECT OF ACIDS AND NEUTRAL SALTS ON SWOLLEN BRAINS*

No. of the guinea pig.	Initial values.		Swelling effected by:	After swelling.	Shrinkage tried by:	After shrinkage.	
	Δ Conductivity (560 H)	Δ Conductivity (560 H)					
No. 39 (Guinea pig)...	{ R L	13.9 (16') 6.064 $\times 10^{-4}$	n/100 NaOH	10.4 (71') 7.007 $\times 10^{-4}$	n/100 Acetic acid	10.9 (155') 3.85 $\times 10^{-4}$	10.1 (295') 3.284 $\times 10^{-4}$
		Δ Conductivity	n/100 NaOH	10.3 (105') 6.632 $\times 10^{-4}$	n/100 HCl	8.7 (173') 4.31 $\times 10^{-4}$	6.6 (327') 3.73 $\times 10^{-4}$
No. 87 (Guinea pig)...	{ L R	14.3 (20') 7.181 $\times 10^{-4}$	n/100 NaOH	12.2 (95') 6.207 $\times 10^{-4}$	n/100 tri- carballylic acid	14.0 (219') 4.185 $\times 10^{-4}$	12.85 (310') 4.158 $\times 10^{-4}$
		Δ Conductivity (560 H)	n/100 NaOH	13.1 (104') 6.260 $\times 10^{-4}$	n/100 HCl	12.4 (222') 4.368 $\times 10^{-4}$	10.9 (320') 4.882 $\times 10^{-4}$
No. 38 (Guinea pig)...	{ L R	15.4 (22') 6.313 $\times 10^{-4}$	n/100 NaOH	11.1 (68') 6.848 $\times 10^{-4}$	.31nNaCl	10.4 (120') 1.222 $\times 10^{-3}$	10.7 (296') 1.222 $\times 10^{-3}$
		Conductivity Capac. μF		.026		.037	.036
No. 45 (Guinea pig)...	{ L R	15.0 (38') 5.823 $\times 10^{-4}$	n/100 NaOH	11.1 (75') 6.722 $\times 10^{-4}$	.31nCaCl ₂	12.8 (135') 3.154 $\times 10^{-3}$	11.0 (325') 4.185 $\times 10^{-3}$
		Conductivity Capac. μF		.025		.085	.14
No. 45 (Guinea pig)...	{ L R	13.4 (21') 6.077 $\times 10^{-4}$	Distilled water.	10.5 (70') 4.671 $\times 10^{-4}$	.33nKCl	11.4 (131') 1.000 $\times 10^{-3}$	10.5 (260') 9.385 $\times 10^{-4}$
		Δ Conductivity (560 H) Capac. μF		.018		.027	.026
No. 45 (Guinea pig)...	{ L R	13.3 (31') 6.327 $\times 10^{-4}$	Distilled water.	10.5 (87') 5.352 $\times 10^{-4}$	.33nKBr	12.0 (136') 1.022 $\times 10^{-3}$	11.3 (270') 1.045 $\times 10^{-3}$
		Conductivity Capacity		.018		—	.027

* Figures in parenthesis mean minutes after death.

TABLE IV.—CONTINUED.
EFFECT OF ACIDS AND NEUTRAL SALTS ON SWOLLEN BRAINS*

No. of the guinea pig.	Initial values.		Swelling effected by:	After swelling.	Shrinkage tried by:	After shrinkage.	
	Δ Conductivity Capacity	Initial values.				9.3 (210') 9.98×10^{-4} .020	9.1 (350') 1.134×10^{-3} .018
No. 84 (Guinea pig) . .	{ R	11.1 (22') 7.196×10^{-4} .020	Distilled water.	9.4 (100') 6.543×10^{-4} .019	.32nKCl		
	{ L						
No. 88 (Guinea pig) . .	{ R	11.0 7.241×10^{-4} .021	Distilled water.	10.2 (90') 5.601×10^{-4} .019	.32nKCNS	7.5 (190') 1.008×10^{-3} .017	7.1 (360') 1.1985×10^{-3} .015
	{ L						
No. 88 (Guinea pig) . .	{ R	—	Distilled water.	10.8 (120') 6.012×10^{-4} .017	.32nKCl	10.5 (205') 9.493×10^{-4} .018	—
	{ L						
No. 88 (Guinea pig) . .	{ R	—	Distilled water.	11.3 (127') 6.543×10^{-4} .018	.32nKJ	8.5 (193') 1.020×10^{-3} .016	—
	{ L						

* Figures in parenthesis mean minutes after death.

in order to study the influence of acids upon swelling not only post mortem but also intra vitam. He found that addition of acids to diluted Ringer solution furthers the swelling only in such concentrations that injure already the excitability. When swelling was produced intra vitam by endogenous production of acids (M. Fischer's³⁰ method of uranyl nitrate intoxication), or when acids were introduced by mouth, no swelling of the myelin sheaths was produced as shown by the birefringence.

The fact that acids further swelling of the brain only slightly, if at all, contrary to their marked swelling influence upon other organs (*c. g.*, muscles), may be due to the high lipid content of the brain. If one studies the state of hydration of proteins and that of lipoids by measurements of viscosity, one finds that acids increase the viscosity and the hydration of proteins but decrease that of lipoids. The actions of alkalis on proteins and lipoids are synergic; they call forth up to a certain concentration a steep increase in viscosity and hydration. The result is marked swelling of the brain and consequently a decrease of Δ . The action of acids upon lipoids and proteins being antagonistic, the effect upon the entire brain may be no change or only quite a slight swelling (decrease of Δ). If a brain swollen by alkali (low Δ) is immersed in solutions of certain acids, such as tricarballic acid, this acid plus the salt formed by the neutralization of the alkali may even induce a shrinkage of the brain (increase of Δ).

Neutral salts lower the state of hydration of protein as well as of lipid solutions as shown by viscosity measurements. It seemed therefore of interest, particularly from a therapeutic angle, to ascertain as to how far neutral salts may inhibit a decrease of Δ or restore the polarizability in a swollen brain. In analogy to the experiments of Haldi³¹ and coworkers on the effect of anions and cations on water absorption by brain tissue, we found that in the series of cations Na inhibits the decrease of Δ more than does K, while Lithium was more effectual than Na. In agreement with the general experiences of a solidifying effect on other organs Ca inhibited the decrease of Δ as compared with Na and induced an increase of this value in a swollen brain. (Table IV.) This effect

³⁰ Fischer, M. H.: Das Oedem, Dresden, 1910.

³¹ Haldi, J. A., Rauth, J. W., Larkin, J., Wright, P.: Am. J. Physiol., 80: 631, 1927.

was more marked if shorter time after death had elapsed. Magnesium, however, has no inhibitory effect upon the decrease of Δ . If the effect of equivalent NaCl and $MgCl_2$ solutions was compared, in the latter solution even a more marked decrease of Δ was found than in the former.

In the group of the trivalent cations, Lanthanum had a distinct inhibitory effect upon the decrease of Δ as compared with Na, while such an effect of Aluminum was missed. In $AlCl_3$ Δ showed even a more marked decrease than in equivalent NaCl after previous swelling in distilled water.

As to the effect of anions, one should expect according to the Hofmeister series that chlorides have a more marked inhibitory effect upon the swelling than bromides. It was found, however, on the contrary, that Δ increased after previous swelling of the brain more in NaBr solution than it did in equivalent NaCl solution. (Table IV.) This is in agreement with the statement of Haldi and coworkers that swelling of the brain is more inhibited by bromides than by chlorides.³² The particular effect of bromides is explained by experiments of Spiegel-Adolf³³ showing that the viscosity and refraction of lecithin sols are more depressed by addition of bromides than by equal concentrations of chlorides. This phenomenon was explained by a chemical reaction between molecular bromine and the unsaturated fatty acid in the lecithin. In NaI and in Na CNS³¹ solution Δ decreased more than it did in equivalent NaCl solution; this is in agreement with the Hofmeister series, while Haldi observed that CNS inhibits the swelling of the brain more than does Cl. Yet also viscosity experiments on cephalin solutions³⁵ speak in favor of the Hofmeister series.

³² The contradictory findings of Bernoulli (Arch. exp. Path. and Pharmak., 73:355, 1913) are perhaps due to the fact that he made his observations too late after death, so that postmortem changes may have interfered. Spiegel-Adolf³⁵ has shown that partial or complete oxidation of the unsaturated group of the lecithin molecule induces a partial or complete disappearance of the specific bromide effect. In an oxydized sample of lecithin bromides behave as expected according to their position in the Hofmeister series.

³³ Spiegel-Adolf, M.: Klin. Wochsch., 11:185, 1932. Biochem. J., 26:2183, 1932.

³⁴ This fact must be borne in mind in view of recent recommendations of CNS-salt solutions for therapeutic uses.

³⁵ Spiegel-Adolf, M.: Biochem. J. 29:2413, 1935.

These experiments indicate that the state of hydration of the brain colloids influences largely the permeability of the cell surface films in that swelling increases the permeability as indicated by the diminution of polarizability. This effect upon the cell surfaces is, at least to some degree, reversible, as shown by the action of acids (acetic, tricarballic acid) and of neutral salts (bromine, calcium, lanthanum salts).

The close relationship between the state of hydration and the polarizability shown in these *in vitro* experiments can also be found *in vivo*. The experiments of Weed, Weed and Wegefardth³⁶ have shown that intravenous injection of distilled water is followed by cerebral edema; finally also hydration of the nerve cells takes place (A. Ferraro³⁷). Such injections increased in experiments of Elsberg and Pike,³⁸ Pike³⁹ and coworkers in most of their cats the susceptibility of the animals to convulsive seizures as tested by absinth injection. When the skull is left intact, it is of course not possible to decide as to whether this change in excitability is due only to the increase of intracranial pressure produced by the increase of brain volume, or whether changes in the physicochemical state of the brain play also a part.

In our experiments the skull was trephined and the dura opened over the parietal lobe so that the electrodes could be inserted here. Changes in intracranial pressure could therefore not be produced by the intravenous injection of distilled water. Special care was taken to keep the exposed cortex warm.

The injections of distilled water are followed by a fall of the polarization index that again may spontaneously rise to some extent. This rise is probably due to extracerebral mechanism that try to restore the isotonia of the blood. These changes of Δ occur independently of the conductivity curve that may first show a slight rise and then fall. This initial rise of conductance may be produced, apart from the permeability change, by the passing of electrolytes from cells into interstitial spaces. To understand the fol-

³⁶ Weed, L. H.: *Am. J. Anat.*, 31: 253, 1923. Weed, L. H., and Wegefardth, P.: *J. Pharmacol. & Exp. Ther.*, 13: 317, 1919.

³⁷ Ferraro, A.: *Journ. Nerv. & Ment. Dis.*, 71: 129, 1930.

³⁸ Elsberg, E., and Pike, F. H.: *Am. J. Physiol.*, 76: 593, 1926.

³⁹ Pike, F. H., et al.: *Am. J. Psychiat.*, 12.(89): 947, 1933.

lowing fall of conductance one has to bear in mind that the injection of distilled water or hypotonic solutions affects also the cerebral circulation (Kubie and Hetler ⁴⁰) Pilcher,⁴¹ and that impairment of the cerebral blood supply tends to diminish the conductivity of

TABLE V.

INTRAVITAL ACTION OF DISTILLED WATER.

Cat No. 54. Parietal lobe measured in ether anesthesia; weight 2.5 kg.

Time	Conductance (560 Hertz).	Δ (4860-560 Hertz).
1.11	2.830×10^{-3}	10.6
1.16	2.830	10.8
1.19	20 cc. Distilled water into femoral vein injected. Deep respiration.	
1.21	2.854	9.78
1.24	2.842	10.5
1.26	2.842	10.5
1.30	20 cc. Distilled water injected.	
1.32	2.796	9.64
1.35	2.790	9.8
1.38	2.778	10.3
1.44	2.762	10.2
1.47	2.738	10.2

Cat No. 58. Weight 1.9 Kg. Decerebrated in the morning; Cerebellum measured.

Time	Conductance (680 Hertz).	Δ (4860-680 Hertz).
4.15	.9231	9.6
4.20	.9231	9.0
4.23	.9649	9.1
4.28	20 cc. Distilled water in femoral vein injected.	
4.31	1.083	8.8
	1.075	9.2
4.35	20 cc. Distilled water injected.	
4.37	1.105	5.4
4.40	1.088	6.2
4.45	1.014	9.0

the brain. Our further experiments indicate that decrease of the oxygen supply of the brain also diminishes the polarizability, while

⁴⁰ Kubie, L. S., and Hetler, D. M.: Arch. Neur. and Psych., 20: 749, 1928.

⁴¹ Cobb, Pilcher: Arch. Neur. and Psych., 24: 899, 1930.

hypnotics and anesthetics have the opposite effect.⁴² Thus the effect of hypotonic solutions or distilled water upon the brain in vivo is somewhat more complicated than in vitro: besides the mechanical effect of the increased volume of the brain (increased intracranial pressure) at least two factors act upon the brain: the swelling of its colloids as already shown in vitro and the impairment of its oxygen supply. Both these factors tend to increase the permeability of the cell surface layers and thus induce an increased susceptibility to convulsive seizures.

SUMMARY.

1. The permeability of the cell surfaces for electrolytes was studied in vitro and in vivo by measuring the polarizability of the brain tissue.

2. Agents that produce swelling of the brain by increasing the state of hydration of the brain tissue (*e. g.*, distilled water, alkali) increase the permeability, as shown by the decrease in polarizability. This is a reversible process, as indicated by the effect of some acids and of hypertonic salt solutions after previous swelling of the brain.

3. These experiments support the view that pathologic processes which call forth swelling of the brain produce an impairment of the cell surfaces in that their density is lowered. The transitory increase in permeability of the cell surfaces that is, according to the modern theories of excitation, an essential part of the excitation process is thus facilitated, and the threshold of the cells for metabolic or other stimuli is lowered. This explains the mechanism by which swelling of the brain increases the convulsive reactivity. Investigations are under way to ascertain as to whether other epileptogenous agents have similar basic effects.

DISCUSSION.

DR. S. BERNARD WORTIS (New York).—I want to congratulate Doctors Spiegel and M. Spiegel-Adolf on their paper—which I think is an important attempt to understand the fundamentals of cortical irritability. I would like to add a note on the nature of the metabolism of brain tissue, which is a

⁴² Spiegel, E., and Spiegel-Adolf, M.: 2nd Internatl. Neurolog. Congress, London, July, 1935. *Revue Neurologique*, Oct., 1935.

biochemical aspect of irritability or the loss of irritability that Dr. Spiegel measures electrically.

During the past seven or eight years, through the work of Otto Warburg, the metabolism of brain tissue has been measured accurately. Small pieces of brain tissue are placed in the Barcroft-Warburg unit, in which one can determine the rate of oxidation of the brain tissue as well as the nature of the foodstuff that such brain tissue is utilizing. The accumulated experience and information by this technique seems to show that brain tissue under normal conditions utilizes sugar or lactic acid. Lactic acid is probably the important foodstuff; sugar is utilized only after its conversion into lactic acid. This fact partly explains the mechanism of hypoglycemic convulsions due to hyper-insulinism. By this means one can measure the oxidation rate of cerebral tissue under the effects of increasing amounts of insulin and diminishing amounts of glucose and lactic acid. If one has insulin in the substrate with brain tissue, the respiratory action of the tissue is depressed below that of the brain tissue in normal Ringer phosphate solution. The brain can use sugar in the absence of insulin, and this is an important biological law and an enormous "factor of safety" to remember for brain oxidations.

With regard to the effect of bromides on brain metabolism, may I say that this effect was measured and reported last year from the Bellevue Laboratory of Experimental Neurology, where it was found that the effect of bromides and other sedatives reduced the oxidation rate of the brain tissue and very often changed the nature of the brain oxidation. (Wortis, S. B.: *Archives of Neurology and Psychiatry*, May, 1935.)

I would like to add this bit of information to what Dr. Spiegel has spoken of, just to point out that his approach considers only one phase of neural action. He is speaking particularly of the electrical reaction of the tissue. The brain metabolism findings take cognizance of another aspect, very likely related; and both views must be considered when speaking of the effects of epileptogenous agents on brain tissue. It has been found that certain diseases produce metabolic changes in brain tissue. For example, we know now that in patients or animals with a polyneuritic syndrome due to Vitamin B deficiency, there is a diminution in the respiratory rate of brain tissue as well as in the peripheral nerve tissue of such people or animals. The oxidation rate of such tissue can be restored to normal in vitro or in vivo by the addition of crystalline vitamin B₁ complex. This chemical aspect undoubtedly has its electrical counterpart. In other words, this material brings together a large group of recent important experimental data which explains in terms of physics and chemistry some of the phenomena that occur in the course of epileptic seizures. May I offer my thanks and admiration to the authors.

DR. A. B. MANGUS (Chicago).—There are two known facts in relation to the factors of metabolism in epilepsy, or in cases subjected to narcosomania therapy. It was brought out in connection with the permeability of the

cells and their effects by alkali and acids. As far as I know, if an epileptic individual is subjected to alkali medium, it does not have any serious effect or alteration upon the convulsive state of the individual. However, if the same epileptic were put in a state of acidosis and if alkali were then injected, the epileptic individual would have no seizure.

I would like to have Dr. Spiegel tell me a little bit more about the subject.

Now the second point, how to explain the difference of the factor of permeability of the cell when we know that dial and the action of dial is distinct in the hypothalamic area, whereas chloroform is a cortical hypnotic.

CHAIRMAN FAY.—The Chair cannot pass this opportunity without one remark, and that is, it seems to us as we have watched Dr. Spiegel's work, that we are growing closer to the therapeutic field that has tried to eliminate a great many drugs and rely on a few, and this delta change which he has demonstrated in the presence of chloral hydrate, bromide and other accepted means of interrupting the seizure, or at least preventing the sensitivity of the cortex, now comes down to physical relationships again.

Those factors that Lennox and Cobb outlined as fundamental disturbances in the oxygen availability and the factors concerned with water balance which we have stressed, contribute toward disturbing the cell permeability.

DR. ERNST A. SPIEGEL (Philadelphia).—The approach to this question of epilepsy from an experimental point of view is of course possible from many angles and we tried to approach it just from the physicochemical point of view. I am sure that a study of the cell metabolism will throw also much light upon these questions. There might probably be some interrelationships between both groups of phenomena. If the oxygen supply of the tissue is lower, then the permeability is increased, as our experiments have shown and this might be the relationship between these two groups of research and study.

As far as the question of alkalosis and acidosis is concerned, one is on rather difficult ground because the clinical findings on these subjects are so varied. For instance, in 1919 Elias claimed that excitability of the nervous system is increased in acidosis, he brings also a tremendous amount of literature proving the point and showing that acidosis increases excitability. This work was later on criticized, rightly I believe, because if acids are too quickly injected, then a failure of the respiratory center and consequently anoxemia might be the result. I think one must be very careful in interpreting clinical measurements on acidosis and alkalosis. The best work so far, I believe, is the work by Bigwood who has shown there is some shift of the acid base equilibrium to the alkaline side in a group of epileptic patients.

As far as experiments on anesthesia are concerned, it was observed by Pick and others that barbiturates act mainly on the subcortical ganglia and chloroform on the cortex. There doesn't exist, however, a toxin that has its action only on a minute part or sharply localized center. All we can say is that

one acts predominantly on a particular region. In dial anesthesia the cortical excitability is still present but if you increase the doses of dial, you will then see that the cortical excitability also diminishes. And furthermore, if you go into the action of chloralhydrate and chloroform, you will surely find they act primarily on the cortex, but you can find some lower centers eventually become also paralyzed. Thus it seems to me we can't assume specific action of these narcotics on a certain part of the nervous system and all we can say is, they act predominantly on this or that part of the nervous system.

FUNCTIONAL PSYCHOSES IN CHILDREN.

AN ANALYSIS OF THE FINDINGS IN TWENTY CASES OF PSYCHOTIC CHILDREN STUDIED AT THE CHILD GUIDANCE HOME.*

By LOUIS A. LURIE, M. D., ESTHER B. TIETZ, M. D., AND
JACK HERTZMAN, M. D.

In the course of a general review of the first 1000 cases of problem children studied at the Child Guidance Home, it was observed with great interest that, excluding those affected with an obvious organic involvement of the central nervous system, such as syphilis or neoplasm, two per cent of the children of this group presented symptoms sufficient to warrant a diagnosis of a definite psychosis. This was all the more striking because these children had been sent to the Home not because they appeared "insane," but because of their failure to adjust either in their homes, or in school, or in the community. This suggests the possibility that the incidence of mental disease among the child population at large may be even greater than what we have been led to suspect from the meager reports in the literature.

Thus, for example, Hagen¹ found only one case of psychosis in children among 72,000 inhabitants. Rhein² was able to collect only 44 cases of psychoses in children and of these, 30 were manic-depressive, 13 were post infectious, and only one suggested dementia præcox. Again Strecker,³ in reviewing 5000 consecutive hospital admissions to the Pennsylvania Hospital, found but 18 cases of psychoses in individuals under 15 years of age. The diagnosis in four of these cases was doubtful, four were diagnosed as dementia præcox, and ten were manic-depressive. Potter,⁴ in a more recent article, reported six cases of schizophrenia in children, ranging in age from 4 to 12, but he made no comment on the incidence. Kasanin⁵ reported findings in ten cases. As late as 1929, Kasanin, in an article entitled "Functional Psychoses in Children" made the following statement: "In clinics dealing with behavior children, such as habit clinics, the Judge Baker Foundation, and to some extent, our own outpatient department (Boston Psychopathic Hospital), reports are to the effect that psychoses in children are

* From the Child Guidance Home, Cincinnati, Ohio, and Longview State Hospital.

rare." In 1931, the same author reported that only two or three cases of affective psychoses in children are seen per year out of an average of 1900 yearly admissions to the Boston Psychopathic Hospital. Kanner,* in a series of approximately 1700 children up to the age of 14, studied at the Harriet Lane Hospital, found only four cases that were considered psychotic. Three of these children, all boys, were diagnosed as schizophrenia. One child had an obsessive psychosis.

Hence, the incidence of 2 per cent of psychoses among an unselected group of one thousand children studied at the Child Guidance Home is very significant and calls for serious consideration.

Psychoses in children are rarely diagnosed as such. The reason for this is twofold. First, the symptomology of psychoses in childhood is not as sharply defined as in adults, and second, such children are, as a rule, first examined by the general practitioner or pediatrician or psychologist, who frequently consider the child's bizarre reactions merely in the light of ordinary behavior problems or antisocial acts. Both the diagnosis and treatment are centered around the individual symptoms without recognition of the implications of the deeper personality changes involved.

The routine at the Child Guidance Home in Cincinnati lends itself very nicely to eliciting both the more obvious and the more subtle changes in the personality makeup of the child. This greatly minimizes the possibility of overlooking early psychotic manifestations. Every child admitted for study and observation at the Child Guidance Home is looked upon primarily as a sick child (in the medical sense) and as such is subjected to a very thorough and painstaking routine psychophysical examination. In addition, during the period of observation, which may last for several months, daily notations of the child's conduct reactions are carefully recorded by members of the staff. The record, therefore, represents a genetic-dynamic study of the child's behavior under carefully controlled environmental conditions.

From the psychiatric standpoint, the behavior reactions exhibited by the child under these conditions are, of course, of tremendous significance. The nature of his contacts with other children, the character of his reactions during the abandon of exciting games, the quality of his responses to the stimulus of competition give definite indications regarding his mental makeup. It is not long before the

* Personal communication from the author.

distinctive personality makeup of the leader, the bully, the coward, the shut-in type of individual, the epileptic, the psychoneurotic and the schizophrenic become sharply defined. In fact, the commingling of different types of psychopathic personalities makes each type stand out in greater relief. This method of study makes possible the early recognition of the prepsychotic as well as of the psychotic child.

A general survey of the twenty children diagnosed as psychotic, reveals that nine were girls and eleven were boys. The ages ranged from 5 to 17 years. The reasons for admission varied from incorrigibility and delinquency to peculiar behavior. The children were referred by their families, schools, juvenile courts, and various social agencies.

Following the official classification of The American Psychiatric Association, thirteen of these children were diagnosed as schizophrenic, six as psychopathic personalities with psychosis, and one as psychotic with probable organic disease. This last case showed no neurological findings to indicate involvement of the central nervous system, but the history was suggestive of a possible previous attack of encephalitis. If the possibility of organic disease is not taken into consideration, this case would have been diagnosed, on the basis of the psychiatric examination and the subsequent course, as schizophrenia.

The case with possible organic involvement is not included in this analysis.

In group 1 (schizophrenia) there were nine males and four females. In group 2 (psychopathic personality with psychosis) there were two males and four females. This would tend to corroborate the common belief that schizophrenia is more prevalent in boys than in girls.

Table I lists the reasons for admission.

TABLE I.

Reason for admission.	Schizophrenia.		Psychopathic personality with psychosis.		Total.
	Male.	Female.	Male.	Female.	
Peculiar conduct	4	4	..	1	9
Determination of mental status....	2	..	..	..	2
Delinquency	3	..	2	1	6
Inability to adjust.....	..	..	..	2	2

From this table it can be seen that peculiar behavior was the reason for admission in more than half of the cases of schizophrenia, while in the group of psychopathic personalities with psychosis, half were referred because of delinquent behavior. It is pertinent, however, to note that three of the schizophrenics were also sent in because of delinquency. It is significant that only two children of the entire number were referred because of a suspicion of mental disease. This should make those in charge of child guidance work be ever on the alert for symptoms of possible deep-seated mental disturbances, even in those cases referred for ordinary behavior disorders, such as delinquency or maladjustment.

The referring sources fell into the following four groups: family, school, juvenile court, and social agencies.

It is interesting to note that half of the cases of psychopathic personality with psychosis were referred by the Juvenile Court, while only one schizophrenic child was antisocial to the extent that he came into contact with the court. Another point of interest in this connection is that only a very small number (two) of these children were referred for observation by the parents themselves, despite the fact that the children's behavior must obviously have been very unusual. One possible explanation for this may be the unconscious desire on the part of parents to reject the existence of abnormalities in their children. In marked contrast to this attitude of the parents is the understanding shown by teachers and social workers, who recognized the need for psychiatric study in these cases. This speaks well for the mental hygiene propaganda that is being carried on among teachers and social workers.

In eleven children of the schizophrenic group there was an acute onset, although in three of these cases the acute onset was on a chronic background. In all of the children in the psychopathic personality group the disease had a slow and insidious onset, although several of the children had an outstanding episode before admission.

The disease was ushered in by moral, intellectual, and psychic disturbances. The character of the onset in the schizophrenic group showed that every child suffered a moral break. By this is meant that the onset was heralded by either the development of antisocial trends or some form of socially unacceptable behavior, such as

excessive masturbation and the like. The psychopathic personality group showed the same trends.

Intellectual impairment was noted at the very beginning in eleven of the thirteen schizophrenics and in four of the six psychopathic personality cases. The apparent intellectual impairment was evidenced by failure to do satisfactory school work, although previously these children had progressed normally. This impairment was more apparent than real, as judged by the results of the psychometric tests, which will be discussed later.

Psychic changes at the time of onset were noted in eleven children of group I and in only two children of group II. These changes consisted of mood disorders, delusions, hallucinations, emotional instability, and many others. All the schizophrenic children who showed psychic changes at the time of onset, also showed intellectual impairment with resulting school difficulties. Six of the schizophrenic group showed impairment in all three fields, but none of the psychopathic personality cases showed such universal involvement. Changes in two of the three spheres, however, were shown by twelve of the schizophrenics and by four of the psychopathic personality group.

In reviewing the histories of the psychophysical development of these children, it was found that they were relatively free of significant physical developmental abnormalities.

The psychical development histories, however, were very illuminating. All the cases in group 2 (psychopathic personality with psychosis) showed abnormal trends in their emotional, social, and intellectual development. In some of these cases (cases 9, 13, and 16) the abnormalities were evidenced at a very early age. In the schizophrenic group, three cases showed no abnormalities of development whatsoever, ten gave a history of abnormal emotional development, and nine of abnormal social development. It is interesting to note that seven of the schizophrenics showed normal school development up to the time of the onset of the psychosis.

Six of the schizophrenic children in this group showed changes in all three spheres. In other words, twelve of the nineteen cases in the entire series showed developmental abnormalities in all three spheres.

The statement has often been made that most adult patients with psychoses showed manifestations of psychic abnormality in child-

hood. The findings in this study would tend to corroborate this belief. The question naturally arises: Is the simultaneous occurrence of abnormalities in the intellectual, emotional, and social development of the child necessarily followed by the development of psychotic states later in life? A review of the findings in a control group of fifty unselected non-psychotic children who had been studied at the Child Guidance Home, showed that fifteen had exhibited such simultaneous developmental disorders early in life. Seven of these fifteen children are now well adjusted; two are in state institutions for the feeble-minded, and five are still problem cases, but show no psychotic symptoms. Only one of these children presented schizoid reactions later in life. Offhand, it would appear from these findings that the simultaneous occurrence of these three psychosocial developmental abnormalities is of no particular significance. A closer analysis of the fifteen cases studied, however, showed that eleven of the children were mentally retarded, two had suffered from acute epidemic encephalitis, one had syphilis of the central nervous system, and one had been diagnosed as a psychopathic personality. In other words, in this group other factors that were present could account for the failure of normal mental and social development.

On the other hand, in this series of psychotic cases there are six children who give a history of simultaneous defect in their intellectual, social, and emotional development without any apparent organic or constitutional factor to account for this occurrence.

Therefore, it would seem fair to say that any child who is not mentally retarded and who has no organic involvement of the nervous system, but who shows a simultaneous break in the normal progression of its intellectual, emotional, and social development, is likely to develop a psychosis later in life and hence should be carefully watched.

A consideration of the family histories showed that in the schizophrenic group there was a much greater incidence of mental disease and emotional instability on the maternal side than on the paternal side. Three of the mothers were psychotic and seven were emotionally unstable, while only one of the fathers was psychotic and five unstable. In five of the schizophrenics both parents were either unstable or definitely psychotic. In the psychopathic personality group, however, all the parents with one exception were either

unstable or definitely psychotic. In this series there were no psychotic siblings in the group of the schizophrenics, and only one psychotic sibling in the group of psychopathic personalities.

An interesting observation regarding the physical environmental factors was that in the group of psychopathic personality with psychosis, the social background was uniformly poor. This was in marked contrast to the schizophrenic group, in which eight of the children came from good homes. This difference, however, did not maintain when the psychical environmental factors were considered. Here, as before, all in the psychopathic personality group had bad backgrounds. This was also true of all but one of the schizophrenic group. Broken homes appeared to play an important rôle in the psychopathic personality group, being present in five of the six cases. In the schizophrenic group it was present in only four of the thirteen cases.

In spite of very careful general physical examinations, no significant physical defects were found in the entire group. The majority of the children had minor physical defects and some had minor neurologic findings. In six of the cases there were endocrine disturbances, but these appeared to have no correlation with the psychosis. The positive laboratory findings were also of minor importance.

In every case studied, a psychometric test was made. In five of the schizophrenic group and in one of the psychopathic personality group there was a scatter of successes. It should be noted that seven of the schizophrenic group rated above normal, one rated as a dull normal, six were rated as cases of probable mental defect, and one rated as feeble-minded. It would not be fair, however, to conclude that those children who rated below normal were originally feeble-minded, as the psychotic state may have influenced their ability to answer the test questions correctly. This should also be a warning against making a diagnosis of feeble-mindedness on the basis of the psychometric determination alone, without first eliminating the possible presence of mental as well as of physical disorders. In the psychopathic personality group, only one child rated below normal.

The psychiatric findings were of great interest. All the children showed disturbances of behavior, mood, insight and judgment. Stream of thought was abnormal in twelve children, ten of whom

were schizophrenic. Memory defects were present in five, four being schizophrenic. Delusions were more frequent than hallucinations. This is especially true of group 2. Sixteen of the series had delusions and ten had hallucinations. Five of the entire group showed abnormalities in all these fields. On the whole, the schizophrenic group showed greater psychic disturbances than the psychopathic personality group. No significant correlation could be made between the intellectual findings as shown on psychometric examination and the degree and kind of psychic disturbance. A fact worthy of note was that none of these children were disoriented.

The children constituting this series have been followed for periods of time ranging from one to thirteen years. Nine of these children are now in Longview State Hospital, one in the State Institution for the Feeble-minded, one in a correctional institution, and two are unaccounted. Six children are at large in the community, three of whom are not well adjusted. Of the three who have apparently adjusted well in the community, one is a schizophrenic and two belong in the group of psychopathic personality with psychosis.

The following case reports are presented to illustrate the type of material on which this study is based:

CASE I.—M. M. is a white boy 13 years of age, who had a natural birth following a normal pregnancy. He walked at one year and began to talk at the age of two. As a child he had measles, German measles, and "black pox." His tonsils and adenoids were removed when he was seven. A year later he was run over by a truck and suffered a fractured leg and elbow. A permanent contracture of the right elbow resulted. In 1932, at the age of 12, he suffered from "heat prostration" and was advised to consult a psychiatrist at that time. Of late his eating and sleeping habits have been irregular.

There is no history of mental disease in the family. The mother, age 49, was born in Russia and has never become "Americanized." She is dull, irritable, but industrious. The father, age 66, also a Russian, had been married before, having three children by his first wife and five by the present wife. His health is fair, he is illiterate, a carpenter, but has not been employed for the past three years. None of the children except the patient has presented a behavior problem. Considering their background they have all received good educations and are making excellent adjustments in life. The patient is the next to the last child and was the "baby" of the family for 12 years before the arrival of his infant sister. They own their home which is in a good residential neighborhood, but their standard of living is much lower than that of their neighbors. The patient has his own room. At home he was disciplined by constant scoldings and beatings, but these only antagonized

him the more. He quarreled, struck his mother and sisters, and constantly annoyed his infant sister.

He was referred for study by the Board of Education because of his peculiar behavior reactions while in the 7th grade of school. At that time, he was 13 years old. He had been demoted to a lower section because of lack of effort. Until this time the boy had been bright, aggressive, a leader. However, he had few friends and quarreled almost continuously with the other children. A contracture of his left elbow placed him at a physical disadvantage with others of his age. He felt this rather keenly. At the age of six he began practicing self-abuse. For the past two years he has done this to excess. Last summer he stated he suffered from "heat prostration" at a time when he could not relieve his sexual tension by his usual methods of self-abuse. For this he had been advised to consult a psychiatrist.

On his first admission to the Child Guidance Home in 1932, the boy was loud, boisterous, a braggart, impertinent, aggressive, and disregarded discipline. Five months later he went to the Cincinnati General Hospital, where an impression of a "'Panic reaction' probably on a sexual basis against a background of a possible early Schizophrenia" was made. He was referred back to the Home. At this time he was seclusive, depressed, sat and stared into space, responded only when spoken to, developed many psychoneurotic complaints, had auditory hallucinations, and abused and exhibited himself openly. He showed an unusual knowledge of sexual affairs. Physical examination revealed only the deformed arm, accelerated bone development, and well developed genitalia. The psychological test revealed an intelligence quotient of 97.

From the Child Guidance Home he was sent to the Columbus Juvenile Bureau of Research. Here no additional psychotic manifestations appeared. Shortly after his return home, he became violent, had many delusions, a dissociated stream of thought, showed stereotyped bizarre activities, and was emotionally unstable. In July, 1933, he was returned to the Cincinnati General Hospital. Here an impression of Schizophrenia was made and he was probated to Longview State Hospital where the same impression was made. At that time, he was 14 years old. After a year's stay here the patient, following several satisfactory short visits, was granted a long trial visit at home. At this time the boy had considerable insight into his condition and was as close to his normal self as he had been since the acute onset of his illness. However, he still shows considerable mental instability.

CASE II.—V. B. is a white girl 14 years of age who had a natural birth following a normal pregnancy. She was breast fed for three months, walked and talked at the usual ages. As a child she had measles and diphtheria. Her tonsils were removed when she was 10. Menstruation began at age 13 and was very profuse, occurring every three weeks during the first year, but after this was not remarkable. Eating and sleeping habits have been regular until of late.

The family history is of interest. The father completed the 8th grade, is employed steadily as a chauffeur, is industrious, temperate, and very con-

siderate of his family. He had reactionary ideas concerning the rights of women and did not understand the problems of adolescence, treating his daughter during her adolescence in the same manner that he did when she was a child. The mother died at the age of 39 when the patient was nine years of age. She had never been strong physically and at age 16 had a severe attack of "inflammatory rheumatism" which left her with a heart condition. She had been over-protected as a child and was always very sensitive. During her adolescence she became very morbid and had periods of depression. These continued throughout her life and became more marked during the last two years of her life. At such times she became upset over any incident. She misconstrued remarks of the family, taking offense at them. During such periods she punished the patient unnecessarily. During the last 18 months of her life, the mother was practically an invalid. The patient never showed any affection for her mother and has never mentioned her mother since her death. The mother's father drank to excess. The stepmother is a poorly educated, indecisive individual, fond of the patient, but too lenient with her, although making an honest attempt to understand and help her through her difficulties. There is a half sister, age five, of whom the patient is very fond.

The family have always lived in an attractive residential district. They have a six-room apartment, the patient always occupying her own room. The home is kept immaculate except for the patient's room which is always in disorder.

As a child the patient had difficulty in playing with other children and has never completely overcome this. She was selfish and had to have her way. She showed no affection for her mother, liked her father, and grew to care for her stepmother. These were the only difficulties noted. In school nothing unusual was noted. She was interested and did good work, passing each year with an average yearly grade of 85 per cent. She had reached the 9th grade at the age of 14. In March the teachers noted that her school work was barely passing. The change had been very gradual. The patient suddenly refused to go to school, complained of headaches, and had several "crying spells." A marked feeling of guilt was noted. She admitted to the school teacher that she had had homosexual relations for about a year with one girl, and was frightened by this. The girl became so frightened that she refused to leave home, saying her relatives made fun of her and people on the street laughed at her. One night she refused to undress or go to bed. She awakened the next day and began screaming and tearing her hair. She stated she hated her father and grandmother and repeated over and over the fear of going crazy. She cried a great deal and had a few outbursts of screaming. Her condition remained the same except that she was more depressed and quiet, and refused to leave her bed. Twice she asked her stepmother if she had ever been attacked, and once asked her if a certain teacher at school had been attacked. She constantly repeated, "I don't know what I'm doing or saying. I can't think. I must be going crazy."

When admitted to the Child Guidance Home on May 5, 1933, physical examination revealed some evidence of hypergonadism and a slight anemia. All other physical and laboratory findings were negative. The psychological examination revealed an intelligence quotient of 103.

At the beginning of her stay, the girl was depressed, wandered about aimlessly, was easily irritated, and was slovenly about her person and room. Her statements frequently were contradictory. She admitted having masturbated. During a conversation she admitted that the suffering of her mother always worried her, and that she had resented her father's remarriage. Although she was attached to her father, she had never made a confidant of him. No unusual interests or aptitudes were noted. After many interviews she admitted having had sexual relations with a girl by whom she was completely dominated. She claimed that these affairs were distasteful to her but that she submitted because she was afraid of the girl.

At the Home temporary improvement was noted. However, she soon resorted to her former behavior, becoming noisy and unmanageable. She would repeat the end of sentences, and if permitted would talk on indefinitely in a quiet, silly, unconnected manner. Later she admitted that she had been the aggressor in homosexual practices and missed these, and resorted to masturbation for satisfaction. On one occasion the girl locked herself in the bathroom and put as much water into the tub as it would hold. When seen through the keyhole she was lying on her stomach in the water and at intervals would hold her head under water. Naturally, it was feared that she would drown. No amount of pleading made her get out. Finally it was suggested that she remove the stopper. This she did. When all the water had run out she began to masturbate, acting like an animal, growling and making peculiar noises. It took her a long time to dry herself. During all this time she made peculiar noises. She finally opened the door, but refused to dress, walking about nude. Finally she went to bed and covered herself with a rubber sheet, bed spreads, and pillow, saying that she was freezing, despite a room temperature of 90 degrees. The girl continued to sing, swore frequently, and used vile language. At times she made grimaces and imitated a baby making noises. She walked up and down the hall, letting out blood curdling yells to frighten the other children.

She had several other manic episodes. A diagnosis of schizophrenia was made, although the possibility of a severe form of a psychoneurosis based on a sex trauma was also considered.

In October, 1933, she was sent to a school for delinquent girls. Here she apparently made a good adjustment and progressed well in school. However, she still exhibited peculiar behavior. At times she would appear over-elated, with a silly grin on her face. She was slovenly in her personal appearance. She continued to make a fair adjustment at the school until February, 1935, when it was noticed that she began to giggle and laugh without apparent cause. She was snappy and curt to the other girls. She complained of pain in her head, for which she was referred to the hospital clinic. One day she complained of "everything going round." She screamed, cursed, and talked

irrationally. Delusions of persecution were evident. The girl attacked the housekeeper. It was necessary to send her to the psychopathic ward. For five weeks she was in an acutely excited state, crying and laughing alternately. Her actions were silly and capricious. She was uncooperative and negativistic. At times her behavior was almost infantile, the girl using "baby language," drawing very simple pictures, and sitting in other patient's laps. She was probated to Longview State Hospital, where the diagnosis of schizophrenia was confirmed.

Comment.—It will be noted that both of these children were referred to the Child Guidance Home not by their parents, but by their teachers. This despite the fact that their actions were very peculiar and bizarre and must have attracted the attention of the members of the family. This attitude on the part of the parents cannot be attributed to lack of interest or to ignorance as the general intellectual and social status of the homes was fair in the first case and above average in the second case.

Neither of these children showed the simultaneous occurrence of abnormal psychosocial developmental changes in the emotional, intellectual and social spheres. In the first case there were disorders in two of the spheres, namely the social and emotional, while in the second case changes in the social development only were present.

The onset was apparently acute in both cases, although both children had been under considerable emotional distress for a long period preceding the acute break. The mental symptoms were typically schizophrenic in their nature.

In both these cases there was noted a paucity of positive physical and laboratory findings.

SUMMARY AND CONCLUSIONS.

An idea that has long been prevalent is that mental disease is comparatively rare among children. Some doubt is cast on this belief as a result of observations made at the Child Guidance Home. An analysis of the first thousand cases showed that two per cent of the children were definitely psychotic. This did not include those children with psychotic manifestations who had an associated organic involvement of the central nervous system. This is a startlingly large percentage and readily leads to the inference that the incidence of mental disease among children may be larger than what has heretofore been suspected.

Of the 20 cases reported, the majority (13) were diagnosed as schizophrenia. Six were classified as cases of psychopathic personality with psychosis. Curiously, there was not a single case of manic-depressive psychosis in the group.

Most of the children in this series were boys, although the difference in number is almost negligible. Their ages ranged from five to seventeen years.

Delinquency was the reason for admission of half of the cases in the group of psychopathic personality with psychosis. This was true to a much smaller extent in the schizophrenic cases. Thus, bad behavior does not necessarily exclude the presence of a psychosis. Hence, when dealing with problem children, the possibility of a psychosis must always be considered, no matter what the original complaint may be.

Very few of the children were referred for study by their parents. This can be attributed either to ignorance on the part of the parents or to a refusal (possibly unconscious) on the part of the parents to recognize the existence of mental abnormalities in their children.

In 11 children of the schizophrenic group, the onset was acute, while in all of the children composing the group of psychopathic personality with psychosis, the onset was slow and insidious. The disease was ushered in by moral, intellectual, and psychic disturbances. All the children suffered a moral break as shown by some form of socially unacceptable behavior. Fifteen of the children showed intellectual arrest as evidenced by their inability to progress normally in school. In 12 of the cases, the condition first manifested itself with the appearance of psychic disturbances.

It is interesting to note that the physical developmental histories in all these cases were essentially negative. On the other hand, the psychical developmental histories are significant in that all of the cases in group 2 (psychopathic personality with psychosis) and in six cases of group 1 (schizophrenia) there was a simultaneous failure of normal development in the social, emotional, and intellectual spheres.

A study of a control group of 50 unselected non-psychotic children who had been studied at the Child Guidance Home showed that a similar arrest in the normal psychosocial development oc-

curred only in those children who were either mentally defective or had an organic involvement of the nervous system.

The simultaneous occurrence of an abnormal trend in the intellectual, social and emotional development of a child, without an apparent organic basis, may therefore presage the development of a frank psychosis later in life.

A predominance of emotional and psychic instability among the mothers of the children in the schizophrenic group was noted, as well as the almost universal presence of constitutional inferiority among the parents of the children comprising the psychopathic personality group. Only one psychotic sibling was noted in the entire series.

In contrast to the uniformly poor physical environmental situation from which the children of group 2 came, were the uniformly good homes from which the schizophrenic children came. Nearly all of the children, however, were subjected to unsatisfactory psychical environmental influences.

The physical, neurological, endocrine, and laboratory examinations were essentially negative. This is in accord with the findings of most investigators. This is in marked contrast, however, to the high incidence of somatic, neurological, and endocrine disorders that were present in the balance of the group of one thousand cases of problem children from which this series of cases was taken.

A psychological examination was made on every case. The findings were not especially significant. Scattering of successes was noted in a small number of cases. Although half of the schizophrenic group rated below average in intelligence, the result need not necessarily be attributed to mental deterioration as the intellectual retardation may be more apparent than real and due to the psychic disturbances. In five of the schizophrenic cases, there was a scattering of successes. This suggests that a low rating on the psychometric test accompanied by a scattering of successes may indicate the presence of some form of psychopathy.

All of the children, on admission to the Child Guidance Home, showed changes in mood, insight, and judgment, although none was disoriented. The schizophrenic group showed greater mental disturbances than the psychopathic personality group. Delusions were more prevalent than hallucinations, fifteen of the children showing delusions and only nine having hallucinations.

The results in these cases are not very encouraging. Only one of the schizophrenic group and two of the psychopathic personality group have made good adjustments in the community. This shows the urgent need for more intensive study and research in this particular field.

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DISCUSSION.

DR. ALBERTA S. GUIBORD (Boston, Mass.).—I should like to ask the doctor if he would tell us a little of the nature of the delusions and the hallucinations, just to get an idea of what they are.

DR. JAMES LEWALD (Laurel, Md.).—It seems to me that Dr. Lurie's paper is particularly timely because there is a tendency to overlook psychoses that occur in childhood. My work, it is true, has been in the subnormal group rather than in the behavior difficulty group, but in a group of selected defectives I found a large number of psychotic children varying in their psychoses from dementia paralytica, the præcox group, some manic-depressives and some of the schizoid type.

In a careful survey of the behavior of all children one will find evidences of early psychoses that can be treated; and I have had favorable adjustments, which is contrary to the findings of Dr. Lurie, in a group of psychotic children, many of the præcox group adjusting under favorable social influences to a better social understanding and social control.

A careful survey of the whole group will undoubtedly show evidence of early paresis in a great many children, and contrary to the usual concept that juvenile paresis is not treatable, we found that with careful early diagnosis and administration of arsenicals and malarial treatment we could arrest the progress of paresis in the juvenile as well as in the adult type of cases.

DR. S. ALAN CHALLMAN (Minneapolis, Minn.).—I should like to ask Dr. Lurie what ages are represented in this group, whether many of them had reached puberty.

DR. LOUIS A. LURIE.—I am sorry that the time is too short to read several case reports that are incorporated in the paper. The delusions were those ordinarily seen in psychotic patients. There was nothing unusual about their nature, except that they were possibly more loosely organized. The same was true of the hallucinations.

The ages ranged from five to seventeen. The ages at the time of admission to the Child Guidance Home varied from eight to sixteen. The majority fell in the age range of 12 to 14 years.

HEAT REGULATION IN DEMENTIA PRÆCOX.

REACTIONS OF PATIENTS WITH DEMENTIA PRÆCOX TO COLD.*

(RÉSUMÉ OF FINDINGS.)

By ISIDORE FINKELMAN, M. D., AND W. MARY STEPHENS, M. D.,
Elgin, Ill.

The reactions to extreme cold of a group of 50 patients with hebephrenic dementia præcox were observed. The oxygen consumption rates, temperature readings, blood sugar determinations and pulse, respirations, shivering and other responses were noted before exposure, during exposure to water at 60° F. and during rest in bed after the bath. These reactions were compared with those observed in non-psychotic subjects and in a group of chronic encephalitics exposed to the same experimental conditions. The patients with dementia præcox react to cold as a group with a lower heat production than the normals. The drop in temperature in the schizophrenics was greater than in the normals. Some of the non-psychotic subjects maintain their metabolic stimulation for some time following exposure. This continued increased metabolic response was not found in schizophrenia. In the normal subjects there occurs a reactive hyperemia, as evidenced by a drop in the inner temperature, after emerging from the cold bath into warm surroundings. The inner temperature drops, the heat being conducted to the cooled body surface. This "after-effect" does not occur in dementia præcox as a group.

Schizophrenics do not have any respiratory shock on immersion in cold water, as a rule. This transient respiratory phenomenon was observed in most of the normal subjects. In schizophrenia there was an absence of, or a very slight shivering response. Many of the non-psychotic subjects shivered, and some, very intensely. There was no significant change in the blood sugar level in any of the groups, indicating that epinephrine, at least in human

* Abstract of paper read at the ninety-first annual meeting of The American Psychiatric Association, Washington, D. C., May 13-17, 1935.

From the department of nervous and mental diseases, Northwestern Univ. Med. School and the Elgin State Hospital.

subjects, does not play a rôle as a calorigenic agent on exposure to cold. Many of the reactions were similar in schizophrenia and in postencephalitic parkinsonism.

We can conclude that in dementia præcox there is a low heat production in response to cold. The heat production is not maintained after exposure and there is no reactive hyperemia. Evidence is adduced that there is a physiologic disturbance in the hypothalamus in schizophrenia.

The observations which are summarized in this paper will be published in detail in the *Journal of Neurology and Psychopathology*.

DISCUSSION.

DR. S. R. LEAHY (New York).—Dr. Finkelman and Dr. Stephens have made a valuable contribution to the metabolic activities of dementia præcox. As might be expected there is a general reduction in schizophrenics to metabolic stimulation as shown particularly by exposure to cold baths. This is in keeping with the response to other forms of stimulation in this disease.

Cameron in 1934 reported a study of heat production and heat control from records of approximately 10,000 temperature readings in 50 schizophrenic and 50 control subjects and also found that at room temperature the internal temperature in the schizophrenic is slightly lower than in control subjects. He found, however, that at room temperature and in extreme cold the mechanism of heat control is more active in the schizophrenic than in the non-schizophrenic group. In extreme heat the mechanism of heat control does not show any weakness in the schizophrenic group. Cameron concludes, therefore, that heat production is lower in the schizophrenic than in the non-schizophrenic group and heat control in the schizophrenic group is more active than in the non-schizophrenics on a compensatory basis.

The absence of respiratory shock on immersion in cold water is in keeping with the response to other forms of stimuli in schizophrenics and in fact seems to corroborate these other findings.

This study has been carefully done and undoubtedly entailed a large amount of work. The whole mechanism of heat regulation is so complex that I believe we need to have such studies corroborated by pathological evidence, of which there is none at present, that the hypothalamus is involved in dementia præcox before one can state definitely that this structure accounts for the findings noted.

I believe further that in the paper the surrounding room temperature should have been stated and that the prevailing climatic conditions should also have been noted.

DR. ROY G. HOSKINS (Boston, Mass.).—I had the pleasure of seeing Dr. Finkelman's manuscript several days ago. Like any other worthwhile, well conducted piece of research, this one raises more questions than it answers. It is a subject that we have been interested in at Worcester for the past three years. At the present time we have rather an elaborate program going on in the laboratory with controlled temperature and humidity. Last year we reported before the Society for Research on Mental Diseases some data bearing on this same general topic, and we are delighted that Dr. Finkelman's findings and ours check excellently.

I think the selection of the subject for investigation and the technique for it have been very happy. There are two or three major approaches to the schizophrenia problem, one of the most promising of which is a study of homeostasis as outlined by Cannon. One can study homeostasis in either of two ways. He can impose a breaking stress and find the point at which the break occurs, or he can impose a graduated stress and find the reactivity at different stages as the stress is imposed. I should say Dr. Finkelman's heroic measures tend rather to approach the breaking stress but fortunately no break occurred.

We have come to the generalization as a result of our work on temperatures and various other things, that what is fundamentally wrong in the schizophrenic mechanism as studied from these points of view is a clumsiness of adaptive responses to changed conditions; that is, we speak of a physiologic clumsiness as characteristic of the group. One has to think here not only of incoordination but of mass effects. If the conception of clumsiness is correct, one would expect to find that schizophrenics in a blundering sort of way and through mass discharges of impulses, would fairly well get by, and schizophrenics do live for a good many years after they acquire the psychoses so they have to be able to compensate at least roughly for changes in environmental conditions.

It is possible that we have here the explanation of the apparent discrepancy between Cameron's results on the one hand and those of Dr. Finkelman and our group on the other. Perhaps Cameron's conditions were set up in such a way as to bring out a rather clumsy mass reaction with the end effect mentioned, whereas if the conditions are set up in a different way, what comes out is a lack of fineness of coordination rather than an ultimate failure of the mechanism.

Freeman and I were quoted as having brought adrenalin into the picture. As a matter of fact, we haven't at any time been concerned with adrenal medulla, but with the cortex.

We agree with Dr. Finkelman in his conception that the hypothalamus is involved in these patients. Our conception of schizophrenia is that it represents a dysfunction rather than pathological change in the hypothalamic region. This might account for adaptational clumsiness, relative inadequacy of the autonomic nervous system, as well as the endocrine system, and we have to think of Bard's emotional center which lies in this same region. If

one thinks of that whole brain mechanism as functioning clumsily, considerable light is thrown upon the mechanism of schizophrenia.

DR. CHARLES F. READ (Elgin, Ill.).—This careful and elaborate study of course represents but a fractional approach to the problem of schizophrenia in general. These fractions will sometime, we hope, be integrated in so far as they may seem worthy of attention.

The cases as selected seem to be representative of a state hospital population. However, I do notice there are many variations of reaction and wonder if it may not be possible to further break down this group by way of classification as to age, type duration of the psychosis, etc., with a view to correlating these results with a study of the personality as a whole.

The conclusions seem to be well argued, especially in view of the results obtained in chronic encephalitics. I am rather interested in the fact that the leukocyte count in the schizophrenics was increased at about the same rate as in the non-psychotics. It is interesting in view of some reports that have been made concerning hemoclastic crises in schizophrenia.

Then one may consider the psychoanalytic approach to this problem, inasmuch as the psychoanalyst contends that the intestinal tract under the control of the autonomic nervous system may be influenced by oral receptive tendencies, etc.; and we may question whether the hypothalamus with its vegetative centers is not also influenced by libidinous drives.

We must pay tribute to the authors, who, in addition to carrying the regular state hospital load, have conducted a study which has involved so much time and care in its preparation.

DR. A. B. MAGNUS (Chicago).—I wonder whether those cases selected for exposure to the temperature changes were not of the group that were previously subjected to continuous hydrotherapy. It is possible that these patients were formerly under a stretch of continuous baths, which are used generally at a temperature of 96, and if so I wonder whether that fact would not have something to do with the lower response to temperature when it is reduced.

Secondly, I want to know whether the differences in response to higher temperature apply to both the normal and the abnormal or schizophrenic group. I didn't catch that. The reader stated that the individuals respond differently to the same temperature, in some individuals there will be a rising temperature to a higher temperature and in others there won't. I wonder if that applies to the schizophrenic as well as to the normal individual.

And third, there are no comparisons of persons who are exposed to higher temperatures in the tub as to whether there is a corresponding increase in the body temperature. The temperature of the skin has always been found to be higher, and in such experiments after careful checking made by myself, we proceed with the reducing of the body temperature. I want to know whether this change or hyperemia that is absent in the schizophrenia is absent in paresis.

Dr. ISIDORE FINKELMAN (Elgin, Ill.).—In the paper we reviewed Cameron's report (*Arch. Neurol. & Psychiat.*, 32:704, October, 1934), but on account of the shortness of time, omitted it in the presentation. In addition to what we have said, there are also some errors in technic. For example one error that we did not mention in our paper is that Cameron used the axillary temperature as a skin temperature. Actually it is not a skin temperature as the axilla is not exposed and therefore is not subject to radiation and conduction to the air and is not greatly influenced directly by changes in external temperature. The axillary temperature should be and is taken as an internal temperature.

We mentioned in the paper that we think there is a psychophysiologic interruption in the hypothalamus in dementia præcox. We have nothing to add to the remarks of Dr. Hoskins as we agree with everything he said. It is significant that the præcoxes had a wide variation. We studied them as a group and not as individuals as Dr. Read mentioned.

With reference to psychoanalytic interpretations, we are of the opinion that psychologic interpretation of physiologic changes have their place and may be indulged in by those with a psychologic bias in the interpretations of dementia præcox.

Normal persons have a climatic stimulability—that is they are stimulated to greater effort or energy in cold climates. Note the advances in civilization in temperate zones as compared with the torrid regions of the earth. Schizophrenics are poikilothermic, their temperature varying to some extent with the environmental temperature. It is an expression of their defective homeostasis.

In answer to Dr. Magnus' question the patients did not have any hydrotherapy before the experiments.

ALLERGIC REACTIONS IN MENTAL DISEASES.

By JOSEPH A. BEAUCHEMIN, M. D.,
Connecticut State Hospital, Middletown, Conn.

The pathologist in a mental hospital is often called upon to be of assistance in the diagnosis of skin diseases, the cause for which may be obscure. In many cases a hypersensitivity to food, plant, endocrine or bacterial proteins has been found in the tests made in our laboratory which gave definite information as to the causative agent, while, in other cases, the patient showed no hypersensitivity. These skin tests were also carried out on employees in our hospital, as requested by the physicians, and in going over the records, there was noticed a marked difference in the reactions. It appeared that the employees very rarely showed a hypersensitivity to any of the proteins, or would give a positive allergic skin-reaction to one or two proteins definitely suspected already as the causative factor of the symptoms present. The patients, on the other hand, gave positive tests to a few proteins in practically every examination by this method and most of them showed a hypersensitivity to more than one class of the proteins.

While there are many hypotheses on the nature of allergic phenomena the consensus of opinion still seems to favor the theory that the endocrine system, in some unknown state of imbalance, may be at fault in these conditions. We also learn that the allergic individual, in addition to acute symptoms such as asthma, hay-fever, diarrhea, migraine and different skin eruptions may exhibit some mental excitement and nervousness or a pseudo-prostration probably dependent on the patient's mental make-up. Many of these persons, it has often been noticed, have physical characteristics pointing to some indefinite endocrine dysfunction, such as fine, silky hair, dry skin, dry mucous membranes, menstrual disorders, and many others.¹ Likewise may we state that patients, suffering from mental diseases of the chronic and malignant types, give evidence, in a great many cases, of physical signs and bodily conformations suggestive of underlying, basic, endocrine disturbance.

With these ideas in mind we decided to test a series of patients suffering from different types of mental disease using, as a standard of comparison, the reactions of normal mentally healthy persons. The abnormal subjects were chosen from our patient population at the Connecticut State Hospital in Middletown. They were divided according to diagnosis into six groups, namely: epileptic psychosis; manic-depressive psychosis, manic type; manic-depressive psychosis, depressed type; dementia præcox; hebephrenic, catatonic and paranoid types. The series diagnosed as epileptic psychosis comprised 60 men and 40 women, approximately all the patients of this class in our institution. The series diagnosed as manic-depressive psychosis, of the manic type, comprised 50 men and 50 women. The same proportion of patients were tested in the depressed type of this class of psychosis. The series of patients suffering from dementia præcox comprised 600 individuals, that is, 200 diagnosed cases in each of the three subgroups of this class, hebephrenia, catatonia and paranoia, 100 or one half of each 200 being women. Each patient was given the same number of skin tests using a representative number of proteins belonging to the classes of foods, plants, bacteria and total endocrine substances and hormones, as shown in the accompanying charts. We believe that these different classes of proteins cover the average, well-balanced hospital diet, the more common bacterial infections, an unfortunately inadequate number of specific endocrine and hormone proteins due to inability to isolate these substances, and the usual great offenders in the grass and pollen class. (See Charts I and II.)

CHART I.

CLASSIFICATION OF PATIENTS TESTED.

Group.	Classification.	Type.	Men.	Women.
1	Epileptic psychosis		60	40
2	Manic depressive	Manic	50	50
3	Manic depressive	Depressed	50	50
4	Dementia præcox	Hebephrenic ...	100	100
5	Dementia præcox	Catatonic	100	100
6	Dementia præcox	Paranoid	100	100
7	Normal healthy individuals.....		50	50

CHART II.

ALLERGIC RECORD SHEET.

Name:

No. —

Diagnosis:

Physical Characteristics and Condition:

SKIN REACTIONS TO FOOD, BACTERIAL AND PLANT PROTEINS:

	Result.	Result.
1. Lamb.		34. Coffee.
2. Beef (muscle).		35. Milk.
3. Pork.		36. Cocoa.
4. Beef Fat.		37. Tea.
5. Pork Fat.		
		38. Cod.
6. Oatmeal.		39. Salmon.
7. Barley.		
8. Bran (whole wheat).		40. Egg-yolk.
9. Flour.		41. Egg-white.
10. Buckwheat.		42. Gelatin.
11. Corn.		
		43. Ovarian substance.
12. Rice.		44. Adrenal substance.
13. Turnip.		45. Thyroid substance.
14. Lettuce.		46. Parathyroid substance.
15. Parsley.		47. Pituitrin.
16. Carrot.		48. Antuitrin-S.
17. Asparagus.		50. Testicular substance.
18. Cabbage.		51. Corticin (adrenal cortex).
19. Spinach.		
20. Lima-bean.		52. Staphylococcus albus.
21. Horseradish.		53. Staphylococcus aureus.
22. Potato.		54. Streptococcus viridans.
23. Beet.		55. Streptococcus non-hem.
24. Pea-bean.		56. Pneumococcus I, II, IV.
25. Cauliflower.		57. Micrococcus catarrhalis.
26. Tomato.		58. Micrococcus tetragenus.
27. String-bean.		59. Bacillus coli.
28. Rhubarb.		60. Friedlander's bacillus.
29. Apricot.		61. Ragweed.
30. Strawberry.		62. June grass.
31. Prune.		63. Timothy.
32. Apple.		64. Golden rod.
33. Pear.		

Remarks:

After much experimentation with different methods of skin testing the technique selected for the tests, we believe, was the most simple, reliable, and while being fairly rapid, also gave uniform results. The great number of tests on each individual necessitated the use of a large area of the body surface. For this reason the back of the patients was selected as the site of preference for this clinical procedure. The part was exposed from the neck to the waist and the subject lay prone on a table in a room flooded with daylight. Five to ten patients could be tested at a time as the technique lent itself well to such a system of action. The back was gently washed with cotton-batting saturated with 40 per cent ethyl alcohol and allowed to dry. Using an ordinary vaccine needle, a sterile one for each subject, rows of scratches for the whole series of tests were made. These were deep enough to break through the epidermis but not to draw blood. They were about one-half to three-quarters of an inch in length and in rows of five. Care was taken that they were spaced at least one and a half to two inches from one another. Sterile normal saline solution was the diluent used in these cases and proved to be more convenient than sodium hydrate due to its slower rate of evaporation. One drop was placed on each scratch with a sterile eye-dropper. One protein substance was mixed with the saline solution on each scarification, with a sterile toothpick, one of the latter being used for each separate protein. The quantity of the test substances used did not matter in the results obtained, but, for economical purposes, the amount which could be taken up from the protein vial on the broad end of the toothpick was the portion employed for the test. The liquid endocrine substances, that is, adrenalin, antuitrin-S and adrenal cortex, were applied on the scarifications without the saline diluent. When the mechanical irritation of the vaccine-needle produced any redness in the surrounding skin, this was allowed to disappear, which it usually did in five to ten minutes, before the saline diluent and the protein were applied. The test substances were not allowed to become dry but more saline was added keeping the proteins moist during the time necessary for the reactions to take place. The results were read in about 10 to 20 minutes after the application of the last test-protein. There were some patients who reacted more slowly and with less intensity than others and they were given a reaction period of 30 minutes before the tests were read.

A positive result was recorded as one giving a definite wheal with or without the pin-point vesicles, but with the pseudopod projections and the rough raised surface, characteristic of an intensely positive test. There were other showings in which the redness extended about a quarter of an inch on each side of the scarification and these were not estimated as true positive reactions but as pseudo-reactions. Many authors believe that these may be considered as evidence of a slight susceptibility to the protein substance, but not of a degree sufficient to produce allergic symptoms in the patient. It was also found that, in the case of the adrenalin, the total adrenal substance and the adrenal cortex, there appeared on the skin an area of vasoconstriction which whitened the epidermis at and around the scarification. If, however, there developed an area of redness or a vesicular wheal with pseudopods around this small white spot the test was considered positive.

The protein substances employed for these procedures were all of the dry, powdered, desiccated type, as prepared by many large, reliable firms manufacturing drug and biological products. The adrenalin, antuitrin-S and adrenal cortex were, of course, in the liquid form.

While the classification of the results was rather difficult in an empirical study of this nature, we believe that they were interesting and that the tests could be developed to serve a definite purpose in the study of mental diseases. They are of some assistance in the diagnosis of skin diseases and could possibly be so in the determination of the allergic factors in the psychoses and of the bearing that an endocrine imbalance may have on the mental development of the child and the adult from the standpoint of mental diseases. They have led us to further studies in laboratory techniques and the elaboration of simple tests which would establish a normal biological endocrine-balance according to demonstrable amounts and relative proportions of the various known and isolated hormones present in the body fluids.

Dividing the patients tested into the six groups shown in the charts the results have revealed fairly constant types of reactions to the different classes of protein substances.

Group I, the epileptic, psychotic individuals, in all cases, gave proof of a definite allergic tendency.

To the meat proteins and fats, 80 per cent of these patients showed positive reactions. There were many pseudo-reactions in the 20 per cent who did not react definitely in a positive manner. This is interesting when one recalls the different dietary treatments advocated in the past for these afflicted people.

To the cereal class of proteins, 64 per cent of the patients were sensitive to one or more of these protein substances.

To the vegetable, fruit and miscellaneous classes of proteins these patients gave rare and irregular reactions of little importance, except for the determination of susceptibilities peculiar to the individual.

To the class of endocrine and hormone proteins, the tests showed a high percentage of positive reactions to total adrenal substance (82 per cent), to total thyroid substance (52 per cent), and to parathyroid substance (65 per cent).

To the bacterial proteins, there were no group reactions of note except to the colon bacillus, to which 70 per cent of these patients gave positive results.

From these findings it appears that patients suffering from epileptic psychosis exhibit an allergic phenomenon common to them as a group and there are indications of disturbances in the power of assimilation and digestion by their body tissues of proteins from meats, of fats, and the proteins of cereals. There would also appear to be a disturbance in the function of the thyroid and parathyroid glands, possibly a hyperfunction, as shown by the fact that a series of the patients of this group and others giving a positive reaction to thyroid proteins had a basal-metabolic rate of plus 18 to plus 35. We have no clinical test to ascertain a hyperfunction of the adrenal and pituitary glands, and biological tests to check up these results did not give uniform findings in the animals injected as for the Ascheim-Zondek reaction.

Group II and III, comprising the two types of manic depressive psychosis, did not give results showing that these individuals were truly allergic persons, but, in their reactions to the different endocrine proteins they exhibited peculiar group-characteristics special to their class of mental disease as a whole and to their types of psychosis also. There were no group-reactions to the proteins in the food and plant classes. The results of the tests with these substances were typical of the occasional hypersensitivity found in

normal subjects. The interesting point was in the classes of endocrine and bacterial proteins. In patients suffering from the manic type of manic depressive psychosis there were noted positive findings in 70 per cent of the cases with total suprarenal substance, in 35 per cent with total thyroid substance, and in 45 per cent of the cases with antuitrin-S. Those diagnosed as the depressed type produced positive wheals with total suprarenal substance in only 8 per cent of the cases, with adrenal cortex in 58 per cent and with the pituitary substance and antuitrin-S in 30 per cent of the total number. There was an increase in the percentage of positive tests with ovarian substance in women and with gonadal substance in men, to 22 per cent and 20 per cent respectively. Many pseudo-reactions appeared with the latter substances which were discounted.

From these findings it would appear that patients suffering from the manic type of manic depressive psychosis are not definitely allergic individuals but may have a complex, endocrine imbalance, characterized, in the manic type of patients, by a possible hyperfunction of the suprarenal and pituitary glands which would, in turn, seem to exert a stimulative effect on the thyroid and sex glands. The hyperfunction of the adrenal cortex would be the indicated conclusion, along the same line of reasoning, in the depressed type of cases with a stimulative effect on the pituitary gland. There was a slight difference in the reactions to the bacterial proteins, the depressed type of cases giving positive tests in a somewhat greater percentage of subjects, which would lead us to believe them more susceptible to infectious agents than the manic type of patients.

Groups 4, 5 and 6, included the three types of dementia præcox. As a class, these groups showed no definite allergic make-up. There were no group reactions to the proteins belonging to the classes of foods, plants, nor to the class of miscellaneous proteins. The positive tests appeared only occasionally denoting simply the individual hypersensitivities.

To the proteins of endocrine origin the three types of dementia præcox, as a class, brought out positive tests to thymic substance on an average of 40 per cent with many pseudo-reactions which were discounted, to ovarian substance in 32 per cent of the women, to testicular substance in 45 per cent of the men, to antuitrin-S in only 8 per cent of the women with many pseudo-reactions present; but in the men the antuitrin-S gave 31 per cent positive tests also

with many pseudo-reactions. The women did not react to testicular substance and the men were negative to ovarian substance. The three types of dementia præcox, taken singly as groups of patients, showed only a slight difference from one another in the percentages of positive reactions but the results demonstrated the same general trend in all the types.

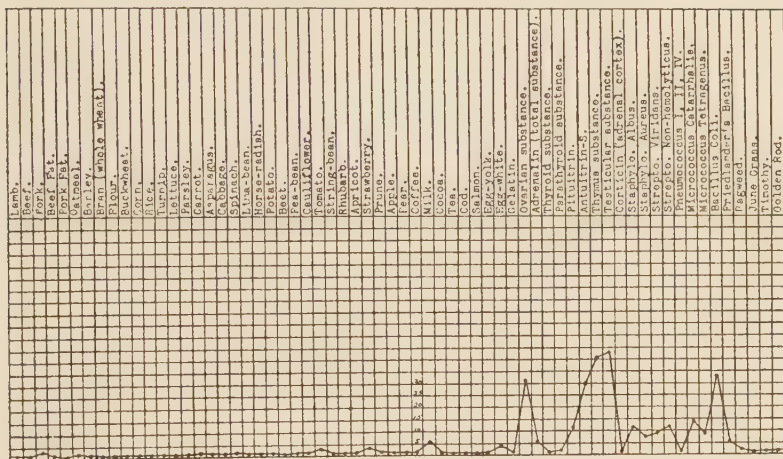
From the above findings it would seem possible to infer that there may be, in these cases again, an endocrine disturbance of some sort which may or may not be a concurrent symptom or a causative factor in the mental disease. The interesting point is the increase in the percentage of positive reactions to the thymic substance which was not met with in the other classes of mental diseases. These patients would also seem to show an increased susceptibility to infectious agents generally and this seems logical when one thinks of the many minor infections met with on the average chronic, hospital ward, in the malignant cases of dementia præcox.

The standard of comparison, as we already mentioned, was a series of 100 normal, mentally-healthy persons, some taken from the occasional routine cases coming to the laboratory, and some 40 volunteers selected for this special instance. The results showed an occasional positive test according to individual hypersensitivities. In two cases there was a reaction to ovarian substance, both being in women. The tests in this series revealed a very marked difference in the findings. The percentages of positive reactions ranged from 1 to 2 per cent in the occasional sensitiveness to individual proteins as against the results stated above for the mentally-sick patients.

In reviewing the data in these experimental studies we gain certain impressions which cannot take the form, as yet, of definite scientific conclusions. There are still many imperfections in the standard laboratory techniques of skin-testing with proteins. The latter are not always absolutely biochemically pure and uniform, especially in the case of endocrine and hormone substances, and the present methods of reading the reactions call for much improvement and some standardization. There is a great need for a simple laboratory test, less complicated and more accurate than the biological Ascheim-Zondek animal reactions, for the estimation of the hormone content of the body fluids. Such a test could prove or disprove the value and efficiency of the commonly used allergic skin reactions and could, itself, be of value in the determination of

CHART VII.

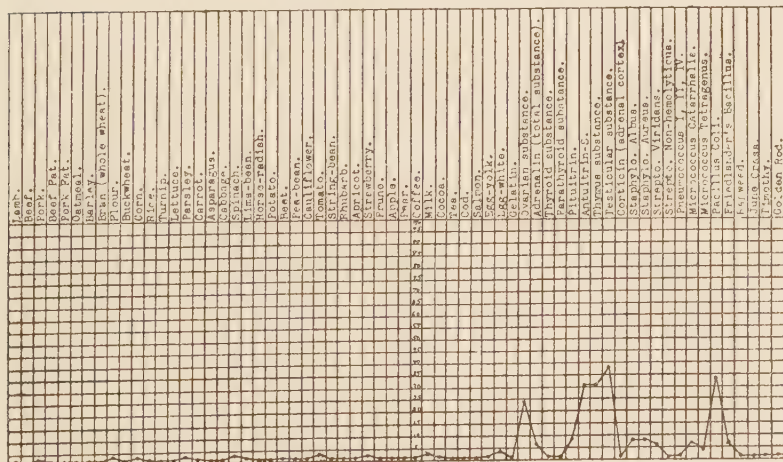
DEMENTIA PRÆCOX, HEBEPHRENIC TYPE.



Each sex shows reactions to thymic substance and its own sex gland protein. Reactions to bacterial proteins are quite increased in this group. Dementia præcox patients as a class seem to show an endocrine disturbance pointing to the thymus gland.

CHART VIII.

DEMENTIA PRÆCOX, PARANOID TYPE.



Each set shows reactions to thymic substance and its own sex gland protein. The male sex shows also an increased susceptibility to antuitrin.

physiological endocrine functions in the healthy and in the mentally-sick. As there is an ever-increasing number of individual hormones being isolated, one by one, from the different histological portions of these glands, these skin tests should be further elaborated with the new products in the hope of gaining more detailed information. Nevertheless, it is interesting to note that patients suffering from epileptic psychosis are evidently allergic individuals reacting to many classes of proteins at the same time. They also seem to exhibit certain evidence of endocrine imbalance pointing towards a definite set of glands of internal secretion, namely, the suprarenal, the thyroid and para-thyroid glands. The patients suffering from a manic-depressive psychosis are evidently not allergic subjects with the many idiosyncrasies to the different classes of proteins simultaneously, but they show a number of reactions giving the impression of an endocrine disturbance, each type with its own trend of dysfunction. The same inference is drawn from the tests on the patients in the class of dementia præcox. In the light of our present knowledge, the establishment of the endocrine factors in mental diseases could give indications for treatment of individuals and groups. (See Charts III, IV, V, VI, VII, VIII.)

I wish to express my thanks to Dr. R. L. Leak, superintendent at this hospital, for his encouragement and his wholesome support in the conduct of these experiments.

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DISCUSSION.

DR. HARRY S. BERNTON (Washington, D. C.).—Dr. Beauchemin and I are in accord in that we both feel the necessity of studying from the allergic standpoint patients who are confined to the state institutions for mental diseases. Several years ago, I sought permission to study the so-called "allergic cases" amongst the patients of St. Elizabeth's Hospital. To my great surprise I was informed that there were very few cases of hay fever or asthma or any other allergic condition among the inmates. There was a far greater percentage of allergic cases among the personnel and medical officers, some of whom were patients of mine. I regard this fact as significant. It confirms Dr. Beauchemin's observations relative to the very few hay fever cases amongst the inmates of his institution.

Allergy has been defined as "hypersensitiveness," "idiosyncrasy," and "altered reactivity to environmental agents." The best definition I know of is that by Jonathan Hutchinson, an English student, who defined allergy as "individuality run mad." Now, it is indeed paradoxical that in those cases in which individuality has "run mad," literally speaking, there are so few cases of hay fever, asthma, and other allergic diseases.

Dr. Beauchemin's report shows evidence of a good deal of industry. In studying his results, I have been impressed, first of all, with the large number of positive reactors to foods in the epileptic group—80 per cent. It has been estimated that about ten per cent of the population is allergic, and of that ten per cent possibly one-quarter may show evidence of sensitiveness to foods. But here we have a group of individuals, 80 per cent of whom show a sensitiveness to foods. The clinical significance of this finding must be determined by clinical trial. If abstinence from the positive reacting foods by the patients diminishes their epileptic seizures, the conclusion is warranted that their seizures are in part due to food hypersensitiveness.

Skin reactions to food proteins have furnished a subject of debate amongst allergists. It does not necessarily follow when an individual gives a positive skin reaction to a food that he is clinically sensitive to that food. For example, a child may show a positive skin reaction to carrots and yet may eat carrots with impunity. On the other hand, he may not show a skin sensitiveness to egg albumen and yet clinically be very sensitive to eggs, as evidenced by hives or by an asthmatic attack. Dr. Alexander Rowe, a distinguished student of food allergy, is of the opinion that skin tests are of less importance than a good clinical history and clinical trial.

I have had the opportunity of testing a large number of individuals with about 30 of the pure proteins which have been isolated from foods by the protein chemist. Curiously enough, no more positive reactions with these chemically pure substances have been obtained than with the ordinary commercial preparations upon which Dr. Beauchemin has depended. That is no reflection on anyone. When a protein extract of a food is prepared and placed upon the patient's skin, that test substance is by no means identical with the substance circulating in the blood which has been derived from that same food. The latter is a product of complicated chemical processes in the mouth, in the stomach, in the intestines and in the liver. I, therefore, feel that the clinical interpretation of these findings must be made with some caution.

Dr. Beauchemin states, also, that in reviewing the findings of his experimental studies, the impression gained cannot take the form as yet of definite scientific conclusions. It is evident that he is conservative, and justly so. When he indicates in his charts that some of the manic-depressive cases show a positive skin reaction to ovarian substance, it does not necessarily follow that there is an endocrine disturbance or an endocrine imbalance in those particular individuals. The conclusion may be drawn that the individuals in question show a skin sensitiveness to ovarian substance of animal origin.

I desire especially to emphasize the differences in reactions which may ensue from differences in chemical composition. These differences can be

demonstrated very readily. A patient, sensitive to celery, may have an eruption of hives on the lips or buccal mucous membrane or at other points of contact. That same patient may consume the celery after it has been cooked without any difficulty. A child may be sensitive to lactalbumin, yet he may drink boiled milk without any embarrassment. The foods in question have been submitted to very simple chemical changes, but the difference in clinical reactions is most marked.

I feel that the investigation would be of greater value if human subjects were tested with extracts of glandular substances of human origin. These could be secured at autopsy or at the surgical table. If I were to test a rabbit with adrenal gland from a human being and if a positive skin reaction were obtained, I would not be justified in concluding that the rabbit is suffering from the various mental upheavals from which mere man occasionally suffers.

There is, nevertheless, an important connection between certain endocrine states and the allergic state. It is only a connection and one hardly explains the other. For example, there are women in whom asthmatic seizures appear at the time of the menses. The English observers were the first to employ the term "menstrual asthma." There are also women who lose their asthma during pregnancy. Moreover, some individuals have a marked exacerbation of hives during the menstrual period. All of these clinically important observations invite solution and interpretation along such lines as Dr. Beauchemin has suggested.

DR. JOSEPH A. BEAUCHEMIN (Middletown, Conn.).—Dr. Bernton remarked that in testing with these endocrine proteins, a positive test in the human skin, with ovarian substance for example, would mean that the patient (and I agree with him) is susceptible to a protein derived from the animal ovarian substance. I experimented with a few skin tests on animals with a similar idea in mind. Grafting guinea-pig ovaries in female guinea-pigs and sensitizing some males with proteins from the same ovaries, I produced definite positive skin reactions in these operated and sensitized animals with the extracts from other guinea-pig ovaries. I could not go on indefinitely with these controls at the time, but this was done for my own satisfaction.

At present, I am not sure that human ovarian proteins would give definite, characteristic reactions in human skin and animal skin, and vice-versa. There is much work to be done in this direction.

PSYCHOTHERAPY OF ADOLESCENTS.

BY FLORENCE POWDERMAKER, PH.D., M.D.,

Department of Psychiatry, Columbia University, New York City.

The case records of adolescents seen during the past seven years in private and clinic practise, in a home for delinquent girls and in a private school, were reviewed from the standpoint of treatment, methods and results. Treatment was based, where possible, on the following diagnostic scheme:

I. Simple maladjustments with no evidence of neurotic difficulty, the problem being solely one of a normal reaction to an unsuitable environment or lack of opportunities for adequate social training.

II. Difficulties arising out of problems such as congenital alexia and mental defect, with or without an accompanying neurotic conflict. The above two divisions will not be discussed.

III. Neurotic or pre-psychotic problems. Treatment plans were based here, as is usual in any case, on types of conflict, degree of stability, intelligence, symptoms and capacity to make a transference. On this last factor, treatment, as distinct from custody or other changes in environment, depends. The lack of this capacity has been taken as a basis for classification rather than the use of such terms as constitutional psychopathic inferior or psychopathic personality. Patients not capable of a transference have been considered as arrested in their development at the narcissistic level. There is no conflict and retreat to this level as in the schizophrenic, but apparently there is an inability to develop, and whether this is constitutionally determined or not can only be surmised. This will be discussed in a later paper. In contrast, those patients that had been classed as psychopathic constitutional inferiors who have been found capable of developing a transference have responded to treatment when it has been directed at unconscious levels.

Another treatment problem of particular importance is the difficulty met with, in some cases, in verbalizing the emotions and successful treatment often depends on an understanding of the factors involved in this problem. In work with children the play technique takes care of this difficulty. This is obviously unsuitable

for these later years. It has therefore often been necessary to undertake a procedure different from the orthodox analytic one in order to give the amount of reassurance necessary to make treatment possible. Aided by the history which is usually available one can at the start discuss the presenting problem with a casual and impersonal attitude which often surprises the patient into cooperation, even though he has come unwillingly. But when a conflict is very near the surface, particularly in the early stages of treatment, and the guilt very strong, the patient may be in an agony of difficulty over the verbalization, even to himself.

A case in point is that of a 13-year-old girl of an intense shyness whenever anything personal was touched upon. She had periods of depression, in one of which she attempted suicide. These alternated with periods of outlandishly awkward, aggressive behavior and uncontrollable giggling. She had been sent away from home at her father's request. At first, contact even at a superficial level was difficult, during both phases, as talking seemed almost impossible. She could not be interested in drawing. Since I had known her sisters and knew the background of her own problem at the start, I practically carried on a casual monologue about the superficial aspects of her family life. Gradually she told her dreams, thinking that they were a great joke, and then came to talk of daily happenings and of her family in a superficial way. Very casually when the dream material seemed to indicate it, I mentioned her jealousy of her brother and resentment of her father's preference for him. Thereupon I was called a mind-reader. She stated with considerable feeling that she couldn't have told it herself, so how could I know it otherwise? I explained how I had deduced it from her dreams and from what I knew about other people's reactions under similar circumstances. Actually it was obvious that she was too guilty over her unconscious death wish toward both to express to herself even a small quota of her conscious negative feeling toward them. Very slowly she began to associate, but with great resistance that was very difficult to analyze. It always seemed necessary before entering into any new phase to relieve her depression resulting from the guilt by giving her a general idea beforehand that I knew what it was about as gleaned from her dreams, and to give her the impression that I accepted it entirely uncritically, before she could begin to work it out in detail herself. One had to guard against her wish to play a dominating rôle and to force me to do all of what she thought of as "work." This had to be analyzed each time it came up.

This case may also be used to illustrate a complication in the transference situation common to adolescent patients if there is an actual present rejection of the parents by the patient, in addition to a neurotic conflict with them in the past. At this period the help of

an adult is still needed, because of lack of years and experience, quite apart from any neurotic dependence. In this case, as frequently happens, there had been no satisfactory emotional contact with parents or parent substitutes; but it was possible to provide one by the intelligent cooperation of a social worker. In other cases it has been necessary at times to have the physician assume an active rôle as well as the passive analytic one. This does not cause difficulty as long as the physician can keep the neurotic situation and the real one clearly delineated, neither does the use of the physician as the ego ideal as long as the counter-transference is clear.

This is illustrated by the case of a boy of 18, a freshman at college, who was terrified of his father and too resentful of the over-solicitude of his mother to have any real contact with her. He had had no friends at his boarding school except for a partial father substitute in the person of the instructor in his major interest, but with whom he lost contact on leaving school. Until he was far enough along in treatment to achieve relationships, considerable time was spent in discussing matters not of neurotic origin but which he had not had the time and experience to think through and solve for himself. This was not used later as material for resistance, as advice was not given, but the method of the platonic dialogue was used, drawing the solutions from him by making the questions clarify the issues.

The problem in adolescent therapy cannot therefore be dismissed with a statement of the difficulty in verbalizing emotions. Postponement of treatment on this ground, in the hope that the difficulty will be outgrown, is not indicated unless one is sure of the superficial nature of the conflict. There is no evidence that the inability to verbalize is due to intellectual immaturity. The chaos which makes an expression of ideas associated with the emotion so difficult seems to be created by the sense of guilt and anxiety which makes intolerable the idea of criticism from within or without. To a certain extent, to be sure, the lack of experience in talking about feelings adds to the difficulty. While it is true that fear of criticism must be removed in any transference situation, such fear is markedly exaggerated in the adolescent, and therefore more reassurance is necessary than with the adult. This may be due, in part, to the fact that the adult comes more often of his own accord. But it must also be remembered that the adolescent has not had time to get the experience in living which even the most neurotic adult has had, which gives him a certain amount of assurance to draw upon. When the adolescent slowly and often fearfully recognizes

that there really is such a thing as a broad tolerance and a respect for the individual with all of his vagaries, the chaos begins to resolve and thoughts and feelings begin to take form and find expression.

This confusion is obvious to anyone dealing with adolescents whether they are "normal" or neurotic and is understandable. In the rapidity with which changes are taking place and development proceeding, it is comparable to the first six years of life. In that period the task of the individual is the modification of the instinctual wishes to meet the demands of the parents and their substitutes, and to learn to accept substitute gratification for instinctual desires. Between the superego and the instinctual forces a certain equilibrium becomes established and the ego structure has obtained a certain amount of integration. But at the onset of puberty and actually for a period before, the ego ideal begins to change at an accelerated speed as the individual takes cognizance of a much wider and less personal world than that of his family and small circle of friends. He begins to accept as ego ideals those not so intimately and personally associated with him. He also feels that he is exercising a degree of choice, in contrast to the early years of his life when standards were thrust upon him. In addition he is coping with instinctual forces of which he was less acutely aware before, and this brings with it a new awareness of self. All of these factors afford new opportunity for conflict.

The equilibrium previously established may be upset in varying degrees depending on the stability of the past ego organization. It should be kept in mind that what is happening appears to be not a simple growth by accretion, as it were, but a reorientation involving a certain amount of breaking down and rebuilding, and learning by trial and error. The acute pathology occurs when there has been no real organization of the ego but a superficial taking over of the parental ideal, without integration with the instinctual forces. Such structure as has been achieved falls apart under the strain of the growing process. The situation in the adolescent may be likened to a battle going on on two fronts. The instinctual drives arising at this period are at odds with the old superego on one hand, and the old superego may be at odds with the new ego ideals. In other words, the picture that one takes over of the parent ideal is not the same at twelve years of age as at five or at two years. From this

arises the feeling of uncertainty and groping which is so obvious. In addition, if the new and old ideals are markedly at variance, guilt and anxiety arise. The slavish imitation that one sometimes sees at this period is an indication of this uncertainty in ideals, as is the alternating rejection and clinging to the parental relationship.

Another prominent factor in the problems of adolescents is the obvious one of the re-emergence of the sexual feelings. It should not be overlooked that the difficulty here, as at earlier periods, may arise not because of the instinct itself or even its indulgence, but because the pleasure derived increases the sense of guilt. This may be particularly marked in cases in which the idea of parental indulgence in sexual relations has been strongly rejected.

This is illustrated by the case of a girl of 16 with a stepmother each jealous of the other. The patient seized an opportunity for an affair with an older married man whose wife was away. Stealing money from the stepmother occurred, and increased markedly after the affair was found out and stopped. A facial tic also appeared for the first time. The eyebrows were raised in an affected surprised fashion and the eyes then rapidly blinked. The patient had refused to accept even the possibility of any conjugal happiness between the father and stepmother and overemphasized their quarrels. Her guilt was marked over her pleasure in her own relationship with her lover, and the fact that later she at times took the initiative. The tic recurred whenever these topics or the stealing were mentioned or when the stealing occurred. When the situation with the parents was worked out, both tic and stealing stopped. She has had normal adolescent friendships with boys of her own age since.

A constructive feature in the treatment of adolescents that one does not see so clearly in work with children is the growing sense of responsibility toward the home and family. This has been particularly marked, probably because of their situation, in the girls who have been removed from their homes by the court because of their delinquencies. Under treatment one of the earliest signs of a beginning adjustment to reality, as their guilt and aggression are worked out, is an increasing appreciation of the family troubles, without anxiety, and a wish to help and assume some responsibility.

In evaluating results in the series of cases it is invariably evident that where there was evidence of neurotic conflict, success was not obtained when the patient was placed in a new environment, no matter how ideal it seemed, nor where treatment consisted only of discussions on a conscious level. On the other hand, it has been

possible to achieve apparently satisfactory adjustments by treatment over shorter periods and for fewer hours than is customary in the usual analytic procedure. After the initial resistance has been overcome the present conflict and its relation to the infantile scene are relatively nearer the surface. Some of these cases have been followed for four or five years and are making good sexual and work adjustment. Details will be given in a later article.

Any statement of the treatment of the adolescent is incomplete without some consideration of the socio-economic background of our society, one of the most noticeable being the wide gap between ideals held up to the adolescent at home and in school and actual life as they see it. This is fostered by the teaching of many religious leaders and educators as well as parents who play upon the so-called idealism of youth, putting before them standards, particularly in regard to sex, which even they may admit cannot be achieved, without realizing the possibility of the guilt that the youth may feel in deviating from them. The normal individual may take such teachings lightly but we have all had experience with those whose early training made that solution impossible. On the other hand an understanding and acceptance of practical, workable human relations is conspicuous by its absence in the milieu as well as in the mind of many adolescents.

A second important social factor in adolescent difficulties in our society, and one that often handicaps therapy, is the attitude that expects, and often requires, social maturity to lag a considerable distance behind physical maturity. This has long been recognized and the blame has usually been put on the prolongation of the period of educational and financial dependence. This theory seems to take it for granted that there is a basic incompatibility between the process of getting an education and achieving social maturity. That there is any such psychological incompatibility may well be doubted. The cause may possibly be looked for in the paternalistic attitude of many educators which discourages efforts involving mature and independent thinking. Similarly it is difficult to see that there is anything inherent in prolonged financial dependence on parents that necessarily keeps an individual immature. It seems rather to be due to the fact that we have been accustomed through centuries to look upon those whom we support financially as dependents, from whom obedience is due.

Another complication arises out of the lack of formulations in our increasingly complicated society. If independence of thought and action are discouraged through the 'teens, then the logical corollary would be the presence of more or less concrete formulations for behavior which are widely accepted by the group. Actually, the reverse of this is true at the present time with its rapidly changing ideas and conditions and an almost paradoxical situation has arisen in which the adolescent is expected to conform to he knows not what. In his none too easy task of integrating his own past with his present, he is also in doubt as to what his "present" affords and expects of him and confusion is worse confounded.

Comment.

DR. BARRETT PASSES.

As the JOURNAL goes to press comes the sad news of the passing, at his home in Ann Arbor, of Dr. Albert M. Barrett, professor of psychiatry at the University of Michigan and director of the State Psychopathic Hospital.

Dr. Barrett's sudden death from a cardiac condition on April second removes one of the most revered leaders of American psychiatry, a great teacher, a loyal and wise friend whom this Association can ill spare. Others will carry on his work but a gap will remain in the ranks.

When in 1906 the new type of institution was created in Michigan, the University Psychopathic Hospital, first of its kind in North America, it was upon Dr. Barrett that the choice naturally fell to inaugurate the pioneer work, shape the policies of the clinic and provide instruction in psychiatry for the medical classes in the university. His record and that of his hospital during all these years furnish testimony to the wisdom of that choice. He has rendered a unique service to his state and university. The clinic at Ann Arbor has been a mecca for physicians desiring graduate work; and men trained under Dr. Barrett have been in wide request as clinical directors, teachers, investigators and administrators.

Dr. Barrett was president of the American Psychiatric Association in 1922, and in many of the Association's undertakings, in council and committees, he has served faithfully and well. He was a senior member of the editorial board of the JOURNAL, and not in name only; he never said no to a request for help, and from first to last was ready to carry his full share of editorial duties. His wise counsel and his loyal support will be sadly missed. He was a man whose judgment one could not fail to respect, and a friend with whom one loved to work.

To the family of Dr. Barrett and to his staff at Ann Arbor, on behalf of his colleagues on the editorial board of the JOURNAL the Editor extends deepest sympathy.

C. B. F.

RESPONSIBILITY IN SUICIDAL DEATH OF ESCAPED MENTAL PATIENTS.

Modern Hospital in a brief note in its February, 1936, issue (page 49) refers to a court action which is of particular importance in the administration of mental hospitals. In this case, which was diagnosed as manic-depressive psychosis, the patient committed suicide following his escape from a sanatorium. The suit of the plaintiff, as administrator of the decedent's estate, was upheld, and on appeal was sustained by the Supreme Court of Errors of Connecticut. The following comment on this case is submitted by James E. Hughes, LL. B., of the Division of Mental Hygiene of the United States Public Health Service:

A recent case in which the Supreme Court of Errors of Connecticut, held a defendant sanatorium liable in the suicidal death of an escaped patient, notwithstanding a showing that the patient had not been committed by a court and a contention that it had no right of restraint, is of interest from several viewpoints.

One of these is the far cry from the days of Pinel represented by this pronouncement of court and jury. Increasing strata of society are coming to a more realistic appreciation of the witticism that "all the world art queer" etc., and the "mentally normal" man has ceased to exist in the discussions and thoughts of students of the mind. But here is an instance of a right being created or recognized in a mental patient which is not enjoyed by persons more nearly approaching the average or normal. This growing clarification of perspective as an effect of the progress of psychiatric medicine could be considered one of the outstanding indications of our culture.

Another source of interest is the reaction to this decision by those who may visualize themselves in the position of the defendant since it is axiomatic that every right presupposes a corresponding duty. Some may conclude that in every instance where an escaped mental patient may commit suicide there will be a negligence verdict. Such reasoning would be based on the theory of the imutability of law. However, no such conclusion is warranted. It is agreed that such patients are entitled to reasonable care, but what, it may be asked, is reasonable care. It may seem paradoxical that, while the judges and jurymen in this case passed judgment after the incident had happened, they could not have defined "reasonable care" in the myriad situations which arise

in the institutional care of mental patients. But such is the nature of our jurisprudence and it must be accepted as a reality.

Some may see in this decision greatly increased difficulties in the care and treatment of mental cases. Even with their greater knowledge of these patients, they realize the impossibility of absolute assurance against suicide while patients remain in an institution, not to mention suicide occurring after a patient has escaped. The answer is that the law is not immutable in any strict sense and that circumstances alter cases. Those engaged in the care of mental patients realize the importance of special care of those with suicidal tendencies and this court decision should make them conscious of the fact that this duty has been based in one case on a legal right of such a patient. This realization should prompt a re-valuing of efforts in this direction in order that there may be made such improvement or increase in efforts as may be deemed necessary.

News and Notes.

DIPLOMATES OF THE AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY.—The American Board of Psychiatry and Neurology, the organization of which was formally announced at the last annual meeting of the Association in Washington (AMERICAN JOURNAL OF PSYCHIATRY, July, 1935, page 226), has held examinations and dealt with the records of a considerable number of applicants for certification as qualified psychiatrists and neurologists.

The following is a list of diplomates certified by the Board to January 1, 1936. They have been classified in two groups. The first, called Class I, is composed of men certified on record. Class II includes those who have been certified after examination. The symbol (P) after a name indicates certification in psychiatry; (N) indicates certification in neurology; (P.N.) indicates certification in psychiatry and neurology.

CLASS I.

Adamson, Elizabeth Ingram	New York City.....	(P)
Allen, Truman James.....	Brandon, Vt.	(P.N.)
Ash, William E.....	Council Bluffs, Iowa.....	(P.N.)
Bancroft, Harold A.....	Hartford, Conn.	(P.N.)
Barrett, Thomas M.....	Marion, Ind.	(P.N.)
Bentley, Inez A.....	New York, N. Y.....	(P.N.)
Block, Siegfried	New York, N. Y.....	(P.N.)
Bonner, Clarence Alden.....	Hathorne, Mass.	(P)
Brill, Abraham A.....	New York, N. Y.....	(P)
Burlingame, C. Charles.....	New York, N. Y.....	(P)
Campbell, C. Macfie.....	Boston, Mass.	(P)
Casamajor, Louis	New York, N. Y.....	(P.N.)
Chambers, Ralph Miller.....	Taunton, Mass.	(P)
Chaney, L. Beverley.....	New York, N. Y.....	(P.N.)
Cheney, Clarence O.....	New York, N. Y.....	(P.N.)
Craig, C. Burns	New York, N. Y.....	(P.N.)
Darling, Ira A.....	Warren, Pa.	(P.N.)
Dershimer, Frederick W.....	New York City.....	(P)
Dexter, Roderick B.....	Foxborough, Mass.	(P)
Doyle, John B.....	Los Angeles, Cal.....	(P.N.)
Ebaugh, Franklin G.....	Denver, Colo.	(P.N.)

Emery, E. Van Norman.....	New Haven, Conn.	(P)
Farmer, W. Scott.....	Nashville, Tenn.	(P)
Farrar, Clarence B.....	Toronto, Ont.	(P.N.)
Farrar, Lonnie Oliver.....	Worcester, Mass.	(P)
Freeman, Walter	Washington, D. C.....	(P.N.)
Gardner, William Emmett.....	Louisville, Ky.	(P.N.)
Gordon, Alfred	Philadelphia, Pa.	(P.N.)
Gosselin, George A.....	Hartford, Conn.	(P.N.)
Gregory, Menas S.....	New York, N. Y.....	(P)
Hall, George W.....	Chicago, Ill.	(P.N.)
Hamilton, Samuel W.....	White Plains, N. Y.....	(P)
Harrington, Arthur H.....	Providence, R. I.....	(P)
Harris, Titus H.....	Galveston, Tex.	(P.N.)
Haskell, Robert H.....	Northville, Mich.	(P)
Hickling, Daniel Percy.....	Washington, D. C.....	(P.N.)
Howard, Merle Q.....	Wauwatosa, Wis.	(P)
Howes, Seth F. H.....	Howard, R. I.....	(P)
Hyslop, George Hall.....	New York, N. Y.....	(P.N.)
Jackson, J. Allen.....	Danville, Pa.	(P.N.)
Jelliffe, Smith Ely.....	New York, N. Y.....	(P.N.)
Keyes, Baldwin L.....	Philadelphia, Pa.	(P.N.)
Leak, Roy L.....	Middletown, Conn.	(P)
Leslie, Frank Elliott.....	Northampton, Mass.	(P)
Long, Thomas Lee.....	San Francisco, Cal.	(P.N.)
May, James Vance.....	Boston, Mass.	(P)
Mayer, Edward E.....	Pittsburgh, Pa.	(P.N.)
McConnell, Whitman Carlisle.....	St. Petersburg, Fla.....	(P.N.)
Mella, Hugo	St. Cloud, Minn.....	(P.N.)
Meyer, Adolf	Baltimore, Md.	(P.N.)
Neal, Josephine B.....	New York, N. Y.....	(N)
Neymann, Clarence A.....	Chicago, Ill.	(P.N.)
Noyes, Arthur P.....	Howard, R. I.....	(P)
Olsen, Alfred Berthier.....	Battle Creek, Mich.....	(P)
Otis, Walter J.....	New Orleans, La.....	(P.N.)
Overholser, Winfred	Boston, Mass.	(P)
Paine, Harlan Lloyd.....	North Grafton, Mass.....	(P)
Parsons, Frederick W.....	Albany, N. Y.....	(P)
Rapaport, Walter	Imola, Cal.	(P)
Ratliff, Thomas Asbury.....	Cincinnati, Ohio	(P)
Raynor, Mortimer W.....	White Plains, N. Y.....	(P.N.)
Reese, Hans H.....	Madison, Wis.	(P.N.)
Ricksher, Charles	Norwich, Conn.	(P.N.)
Robbins, James Merle.....	Kenilworth, Ill.	(P)
Ruggles, Arthur H.....	Providence, R. I.....	(P)
Rutherford, Thos. A.....	Clarks Summit, Pa.....	(P)
Sands, Irving J.....	Brooklyn, N. Y.....	(P.N.)

Schwenkenberg, Arthur J.....	Dallas, Tex.	(P.N.)
Siewers, Albert B.....	Syracuse, N. Y.....	(P.N.)
Singer, H. Douglas.....	Chicago, Ill.	(P.N.)
Sleyster, Rock	Chicago, Ill.	(P)
Solomon, Harry Caesar.....	Boston, Mass.	(P.N.)
Steckel, Harry A.....	Syracuse, N. Y.....	(P)
Stevenson, George S.....	New York, N. Y.....	(P)
Thompson, Charles Edward.....	East Gardner, Mass.....	(P)
Timme, Walter	New York, N. Y.....	(P.N.)
Tryon, Geneva	Dorchester Center, Mass.....	(P)
Turner, Carrol C.....	Memphis, Tenn.	(P.N.)
Uhler, Claude	Farnhurst, Del.	(P.N.)
Viets, Henry R.....	Boston, Mass.	(P.N.)
Waterman, Chester	Norwich, Conn.	(P)
Wearne, Raymond G.....	Central Islip, N. Y.....	(P)
White, William Alanson.....	Washington, D. C.....	(P.N.)
Wiedman, Otto G....	Hartford, Conn.	(P.N.)
Woltman, Henry W.....	Rochester, Minn.	(P.N.)
Wood, W. Franklin.....	Waverley, Mass.	(P)
Zabriskie, Edwin G.....	New York, N. Y.....	(P.N.)
Ziegler, Lloyd H.....	Albany, N. Y.....	(P.N.)
Zilboorg, Gregory	New York, N. Y.....	(P)

CLASS II.

Angus, Leslie Robert.....	Hartford, Conn.	(P)
Arbuse, David Irving.....	New York, N. Y.....	(N)
Barrett, Joseph Eagle.....	Boston, Mass.	(P)
Bennett, A. E.....	Omaha, Nebr.	(P.N.)
Bookhammer, Robert S.....	Philadelphia, Pa.	(P)
Bucy, Paul C.....	Chicago, Ill.	(N)
Carmichael, Donald M.....	Brentwood, N. Y.....	(P)
Carmichael, Hugh Thompson.....	Hartford, Conn.	(P.N.)
Conn, Jacob H.....	Baltimore, Md.	(P)
Coon, Gaylord Palmer.....	Foxborough, Mass.	(P.N.)
Duncan, Dean Hume.....	Shreveport, La.	(N)
Feigin, Samuel	New York, N. Y.....	(P)
Finesilver, Benjamin	New York, N. Y.....	(N)
Fitzpatrick, Charles Patrick.....	Providence, R. I.....	(P.N.)
Guthrie, Riley H.....	Boston, Mass.	(P)
Hare, Clarence C.....	New York, N. Y.....	(P.N.)
Helfand, Max	New York, N. Y.....	(N)
Hinsie, Leland Earl.....	New York, N. Y.....	(P)
Houser, Gerald Frederick.....	Boston, Mass.	(P)
Kasanin, Jacob	Howard, R. I.....	(P.N.)
Kaufman, M. Ralph.....	Cambridge, Mass.	(P.N.)
Keill, Kenneth	Brentwood, N. Y.	(P)

Lang, H. Beckett.....	Brentwood, N. Y.	(P)
LeDrew, Frederick	Mattapan, Mass.	(P)
Mackay, Roland P.....	Chicago, Ill.	(P.N.)
Merritt, H. Houston.....	Boston, Mass.	(P.N.)
Murphey, Bradford J.....	Colorado Springs, Colo.....	(P)
Patry, Frederick Lorimer.....	Albany, N. Y.....	(P)
Prout, Curtis T.....	Hartford, Conn.	(P.N.)
Putnam, Tracy Jackson	Boston, Mass.	(P.N.)
Reback, Samuel	New York, N. Y.....	(P.N.)
Richter, Richard B.....	Chicago, Ill.	(P.N.)
Rothschild, David	Foxborough, Mass.	(P.N.)
Schube, Purcell George.....	Boston, Mass.	(P)
Shapiro, Isaac	Schenectady, N. Y.....	(N)
Southerland, Robert Williams.....	Brentwood, N. Y.....	(P.N.)
Thomas, Jackson M.....	Waverley, Mass.	(P.N.)
Tillotson, Kenneth J.....	Waverley, Mass.	(P)
Vonderahe, A. R.....	Cincinnati, Ohio	(P.N.)
Wagner Carl P.....	Hartford, Conn.	(P.N.)
Woolley, Lawrence F.....	Towson, Md.	(P)
Yakovlev, Paul Ivan.....	Palmer, Mass.	(N)

REORGANIZATION OF THE INTERNATIONAL LEAGUE AGAINST EPILEPSY.—At the time of the International Neurological Congress in London, a meeting of those particularly interested in epilepsy was held, July 31, 1935, at the Lingfield colony. Thirty-two doctors representing 14 countries were present. After discussion, it was unanimously decided that the International League against Epilepsy should be revived. The immediate efforts should be directed towards the improvement of the social condition and the institutional care of persons with epilepsy. To this end, it was agreed that there should be a publication, issued annually or oftener, acquainting readers with facilities and with remedial efforts carried on in various countries. Plans were also laid for a meeting of the League at the time of the next Neurological Congress in Copenhagen.

At an adjourned meeting held Aug. 2 (Prof. A. Ley of Brussels in the chair), the following officers were elected: President, William G. Lennox, Boston, U. S. A.; Secretaries, H. I. Schou, Dianalund, Denmark, L. J. J. Muskens, Amsterdam, Holland; Treasurer; Tylor Fox, Lingfield, Surrey, England.

All persons interested in improving the condition of epileptics are invited to join the League. Membership, which includes subscription to the periodical, is the equivalent of 5 shillings a year, or 15 shillings for the four-year period.

BRAINS DESIRED FOR RESEARCH.—The Department of Neurology and Psychiatry of the Albany Medical College is engaged in a research problem which requires brains of individuals under 45 years of age, who have had either dementia precox or manic-depressive psychosis.

It is necessary that certain conditions be fulfilled in the preparation of this material. The necropsy should have been performed not later than 9 hours after death, and the brain weight recorded in grams at the time of necropsy. Brains should be suspended in a two-gallon jar of fresh 10 per cent formalin solution where they should remain at least 10 days. Brains should not be sliced. Only specimens of well studied brains are desirable, and an abstract of the history must be accessible.

All expenses incurred in supplying specimens and abstracts will be defrayed. We shall be grateful to those who will be able to supply the desired material. For further information or instructions please write to Lloyd H. Ziegler, M.D., Professor of Neurology and Psychiatry, Albany Hospital, Albany, N. Y.

MARYLAND INVESTIGATION.—The special commission appointed by Governor Harry Nice to investigate the state hospitals of Maryland is expected to send in its report in the near future.

The commission, consisting of three psychiatrists and three laymen, follows in the wake of another investigation by a legislative committee of three lawyers which was created last winter to "investigate the state institutions." This committee acted without the benefit of medical or technical advice and proceeded to concentrate their attention on the state hospitals, which under a depleted budget had been operating with a per capita maintenance cost of 57 cents a day.

PENDING FEDERAL LEGISLATION.—A new juvenile court bill for the District of Columbia is now pending in Congress and is provoking considerable discussion. The bill, H.R. 10363, 74th Congress, 2d Session is a very interesting one, and was prepared by well qualified persons. Informed observers state that the adverse criticism the bill has thus far received is illuminating as illustrating the traditional prejudices that appear on the introduction of any progressive legislation in the medico-legal field.

Also pending before Congress is H.R. 3451 which would improve the method of commitment to St. Elizabeth's Hospital. Although considerably altered since introduction, it is still a constructive piece of legislation.

Both of these bills are important and significant as movements in the social realm for practical psychiatry.

CONNECTICUT SURVEY.—Considerable work has already been done by the special commission appointed by Governor Cross of Connecticut to make a survey of existing facilities for the care of the mentally ill and to recommend necessary changes in physical plant, statutes and methods to the incoming legislature next January.

Three members of the American Psychiatric Association are on the commission, Dr. Roy L. Leak, superintendent of the Middletown State Hospital, Dr. C. Charles Burlingame of Hartford, and Dr. Eugen Kahn of New Haven.

EXAMINATION FOR THE POSITION OF DIRECTOR OF THE NEW YORK STATE PSYCHIATRIC INSTITUTE AND HOSPITAL.—The Department of Civil Service of the State of New York announces that an open competitive examination for this position will be held during May 1936.

The Psychiatric Institute and Hospital is a 200 bed institution, located in the Columbia-Presbyterian Medical Center on West 168th Street, New York City. It is the research-teaching center of the Department of Mental Hygiene and is supported by state appropriations. The laboratories for research are extensive and under the direction of qualified scientists, but it is the duty of the director to co-ordinate the research program. In addition the direc-

tor is responsible for the investigations being made in the field of clinical psychiatry. Courses of instruction in psychiatry for junior medical officers of the institutions in the Department of Mental Hygiene are held at the Institute annually, courses of training in neuropathology are given from time to time and one of the important duties is to give and supervise the instruction in psychiatry to medical students and to pupils in the schools of nursing maintained in the medical center. An active out-patient department is maintained.

The salary of the director is \$6000 per year with \$3000 additional in lieu of maintenance, making a total of \$9000. From this amount a deduction is made for pension purposes. The present incumbent is professor of psychiatry in the College of Physicians and Surgeons of Columbia University; and this position carries a salary of \$2500 a year. The director to be appointed probably will be accepted by the University if qualified to direct the psychiatric instruction to medical students.

This examination is open both to residents and to non-residents of New York State. Application forms for the examination may not be issued by mail after May 14, 1936, and to be accepted should be delivered personally or bearing postmark not later than May 15, 1936.

Candidates must be at least 30 years of age and must be United States citizens, by birth or naturalization; in the latter case naturalization papers must be submitted in proof of claim. If naturalized directly, the applicant's final certificate of naturalization must be submitted. If citizenship is claimed by the naturalization of a parent during minority of child, final naturalization certificate of such parent must be submitted. All such papers should be sent by registered mail. In case the original naturalization papers have been lost, a copy of the naturalization certificate should be procured from the Naturalization Bureau, Washington, D. C. An application from a foreign-born person claiming citizenship but failing to furnish the required proof will be rejected. Declaration of intention to become a citizen will not be accepted. Full citizenship and final papers are necessary.

Minimum Qualifications.—Candidates must be graduates of a medical school registered by the New York State Department of Education and must be licensed to practice medicine in New York

State or be eligible for such license. They must have had not less than ten years of satisfactory experience in clinical psychiatry, during which time each candidate must have demonstrated outstanding leadership in the field of psychiatry, psycho-biology and psychopathology, and allied subjects. Experience in the teaching of psychiatry is desirable.

At the time of filing applications, candidates must submit publications or other evidence of demonstrated ability and leadership in psychiatry and other related fields mentioned.

Veterans claiming preference in appointment because of disablement in war service, should write, at the time of making application, for special form on which to file such claim.

Candidates are required to attain at least 75 per cent. They will be rated by a group of distinguished physicians to be selected by the New York State Civil Service Commission. As an aid in rating training, experience and general qualifications, personal interviews may be required at a later date. All statements on applications are subject to investigation.

For application forms address Examinations Division, State Department of Civil Service, Albany, New York.

POSTGRADUATE COURSE, MENNINGER CLINIC.—Dr. Israel Wechsler of New York City and Dr. J. W. Kernohan of the Mayo Clinic will cooperate with members of the staff of the Menninger Clinic in a postgraduate course held at the Menninger Clinic, Topeka, Kansas, April 20-25, 1936. The subject of the course will be "Neuropsychiatry in General Practice," and will conform essentially to the outlines of the course given last year. Lectures, case studies and seminars included in the five and a half day course will be expressly directed to the application of modern neuropsychiatric principles to cases which the general practitioner frequently sees in this field. Enrollment in the course is limited to 30.

MEETING OF AMERICAN ASSOCIATION ON MENTAL DEFICIENCY.—This association composed of some 500 educators, psychologists, sociologists and psychiatrists is holding its sixtieth annual meeting at the Hotel Jefferson, St. Louis, Mo., on May 1, 2, 3 and 4, 1936.

The Friday sessions will be devoted to general and sociological aspects of mental deficiency; the Saturday sessions to psychological and educational topics with special stress on educational disabilities. The Monday sessions will be given over to research activities, medical aspects and administrative problems in mental deficiency.

Some of the speakers are: Popenoe on "Sterilization," Goddard on "Social Security," Hincks on "A National Program," Kirkbride on "Public Welfare," Hackbusch on "Social Service," Vanuxem on "Education," Berry on "Teaching Techniques," Humphreys on "Research Problems," and many others. Everyone interested in the mentally defective or retarded child is cordially invited to attend these sessions. The complete program may be obtained from the Secretary, Dr. Groves B. Smith, Godfrey, Illinois.

THE ELEVENTH INTERNATIONAL CONGRESS ON PSYCHOLOGY.—The Eleventh International Congress will take place in Madrid, September 6-12, 1936. The official languages of the Congress are English, French, German, Italian and Spanish.

The program will comprise:

(a) Symposia, each of which will be conducted by two or more psychologists.

(b) Round table conferences in which eight to ten members especially interested in individual topics will, under the guidance of a chairman, discuss their particular problems.

(c) Open conferences in which members who have specialized in individual problems of contemporary psychology will offer their findings.

(d) Individual communications of a variety of topics.

Membership in the Congress includes active members, fee 75 pesetas (approximately \$10.50), associate members, fee 40 pesetas (approximately \$5.60), and supporting members, fee 100 pesetas (approximately \$14.00). Active membership is open to psychologists or specialists in related sciences. They may present papers and take part in discussion, and will receive all of the official publication of the Congress. Associate membership is open to others interested in the work of the Congress. They may attend the meetings, but may not take part in the discussion, and will not receive the scientific

publications. Supporting membership includes scientific organizations, libraries, etc., which are disposed to share in the expense of the Congress and will receive the published volume of transactions.

Professor E. Mira is president of the Congress; J. Germain, general secretary, to whom correspondence may be addressed at the headquarters of the Congress,—l'Instituto Nacional de Psicotecnia á Madrid (Alberto Aguilera, 25).

THOMAS WILLIAM SALMON MEMORIAL LECTURES.—The Salmon Committee on Psychiatry and Mental Hygiene announces the fourth series of Thomas William Salmon Memorial Lectures to be given by Samuel T. Orton, M. D., Friday evenings, April 10, 17, and 24, 1936, at 8.30 at the New York Academy of Medicine, 2 East 103d Street, New York. Dr. Orton's subject is "Developmental Disorders of the Language Faculty and Their Psychiatric Import." The several lecture topics are:

Lecture I. Language Losses in the Adult as the Key to the Developmental Disorders in Children (April 10).—A discussion of the physiological background of the language faculty as revealed in the aphasias. The problem of unilateral cerebral dominance. Reports of studies indicating that all degrees of intermixture occur between right and left sidedness. Such intergrading between the hemispheres is suggested as the background for many language disorders in children.

Lecture II. The Syndromes of Disorder in the Development of Language (April 17).—Six syndromes are discussed from the point of view of their symptomatology: reading disability (strephosymbolia), developmental word deafness, congenital apraxia, motor speech delay, writing disability, and stuttering.

Lecture III. Treatment and Psychiatric Interpretation (April 24).—A brief review of the general principles of treatment of the various syndromes, together with a discussion of the relation of these conditions to emotional and mental development.

DR. DIETHELM GOES TO THE NEW YORK HOSPITAL.—Dr. Oskar A. Diethelm, associate professor of psychiatry at the Johns Hop-

kins Medical School in Baltimore, has been appointed psychiatrist-in-chief of the New York Hospital and professor of psychiatry in Cornell University Medical College, assuming his new duties in March of this year. Dr. Diethelm succeeds Dr. George S. Amsden, who retired from both these positions in 1935.

A native of Switzerland, Dr. Diethelm graduated in medicine at the University of Berne in 1923. In 1925 he joined Dr. Adolf Meyer's staff at the Henry Phipps' Psychiatric Clinic of the Johns Hopkins Hospital, becoming resident psychiatrist in 1927, and associate professor of psychiatry in 1932.

Dr. Diethelm's experience as a clinician, teacher and investigator, assures that the work which has been carried on by Dr. Amsden with so much distinction will be maintained at the high level which has been established at the New York Hospital and Cornell Medical College.

Book Reviews.

KREISLAUF UND HIRNTUBERKULOSE. (THE CIRCULATION AND TUBERCULOSIS OF THE BRAIN—An investigation into the pathological changes in the arrangement of blood vessels, due to inflammatory cerebral states.) By *Dr. Phil. et med. Richard Arwed Pfeifer*. (Dresden & Leipzig: Theodor Steinkopff, 1935.)

The author has extended the technique which he has previously used in the study of the normal arrangement of the small vessels in brain tissue, 1928, to observations on these vessels under pathological conditions.

Arterial injections of emulsions of tubercle bacilli into monkeys have resulted in widespread foci of cerebral tuberculosis of three types:— (a) The inflammatory-exudative, leading to caseation, (b) the inflammatory-productive, with tubercle formation and (c) an inflammatory-cirrhotic type. He makes the interesting suggestion that the tuberculous "giant-cell" may not be an individual cellular element but a thrombosed, degenerate bloodvessel, the peripherally-arranged nuclei being those of the endothelial cells which originally lined the lumen of the vessel.

The major part of the work is devoted to the changes which take place in the arrangement of the blood-vessels in the neighbourhood of, and within tuberculous lesions. He emphasizes the importance of the arterial embolic spread of the tuberculosis to the brain-tissue, with a resultant focus of tuberculous arteritis, from which the lesion spreads. He confirms the observation of the avascularity of the centre of a caseating tuberculous lesion. There is considerable distention of the small vessels surrounding the lesion in its earlier stages, which may give place later to comparative avascularity, especially in the cirrhotic type of the disease, due to the proliferation of connective-tissue and consequent strangulation of the blood-vessels of the area.

The monograph is excellently and profusely illustrated.

ERIC A. LINELL,

University of Toronto.

MY ADVENTURE INTO SPIRITUALISM. By *E. Lee Howard, D.D.* (New York: Macmillan Co., 1935.)

This is a book in which a minister of the Congregational Church in the United States describes very vividly certain experiences by which he has become convinced that the spirits of those who die do not necessarily lose all possibility of contact with those still living. Just as in the records of telepathic experiences there seems to be a core which resists all efforts to explain the phenomena on a materialistic ground, so some of Dr. Howard's experiences

do not seem to be readily explainable if his premise is denied. He admits spiritualism has gained an unsavory reputation by reason of the veniality and dishonesty of some of its practitioners, and there is no need to stress the point that "he believes who wishes to believe."

As a record of the full, interesting life of a minister of God in the United States of today, a man of sincerity, courage and imagination, the book leaves nothing to be desired. Dr. Howard has met and known many interesting people and his unconscious revelation of his own character proves him to be a single-hearted and completely honest Christian. He has succeeded in reconciling sincere faith with his spiritualism and perhaps as striking a passage as any is to be found in one of his closing paragraphs where he says, "When that day comes everything that is true and noble and wholesome in Spiritualism will receive an appraisal and acceptance that shall recover to the Church of Christ the ancient power of Pentecost. And just as staunchly as I have been loyal to the Christian faith shall I continue to maintain the truth in Spiritualism. The name may be a reproach for a long time yet, but even on the most scornful lips it can never be such an epithet of contempt as was once the word 'Christian.' 'Spiritism' and 'psychism' have never obtained naturalization in my personal vocabulary. But sensible persons never quarrel about verbal preferences—they simply ask the right to use the words that have become most greatly fraught with meaning to themselves."

J. L. BIGGAR, M. B.

A SURVEY OF INDUSTRIAL MENTAL HYGIENE. (Pittsburgh: School of Medicine, University of Pittsburgh, 1934.)

As the title implies, this publication is a survey. It is largely confined to a statistical analysis and classification of the incidence of certain conditions in industry, drawn from different sources. There is no broad interpretation of the findings; nor are there any specific recommendations for the alleviation of the conditions found. The use of the term "Mental Hygiene" is considerably extended to cover the wide diversity of material dealt with. There are statistics presented with regard to the importance of mental hygiene in industry and in general; there is a classification of various hospital cases along with an analysis of their personal data sheets; there are discussions relating to employee rating, industrial accidents, workmen's compensation, industrial poisons, and several other topics concerned in general with the work of the physician in industry.

The study displays the usual disadvantages of a strictly statistical survey in that, although it may prove a handy statistical reference for certain information, it leaves one wondering what it is all about.

S. N. F. CHANT.

PSYCHOLOGY AND HEALTH. By *H. Banister, M. Sc., Ph. D.* New York: The Macmillan Company. (Cambridge: The University Press, 1935.)

The author, who is lecturer in experimental psychology at Cambridge University, has apparently written this book as an introduction to psychiatry

for medical students, medical practitioners and other interested persons. He presents a dynamic approach, drawing upon various sources for his views, but with an anti-Freudian prejudice, including liberal stock criticisms of the Freudian theories of infantile sexuality, the ubiquity of Eros, sexual symbolism in dreams, the Oedipus complex, etc.

Chapter I is an excellent summary of the necessity for psychiatry in medical practice. Chapter II contains scholarly definitions of the person, reflexes, emotions, sentiments, complexes and character. The following chapters on mental defect, the problem child, infantile sexuality, problems of adult life, effects of ill health and invalidism are aptly though briefly discussed. The chapters on suggestion, hypnosis, the unconscious and dissociation, conversion hysteria, anxiety states (these he regards as neurasthenia and gives as symptoms depression, insomnia, irritability, inappetence), compulsions and obsessions are clear discussions of the various subjects but include no discussion of the major psychoses and their early differentiation from the psychoneuroses.

The presentations of the theories of Janet, Freud, Jung and Adler are brief and intelligible. Three well written chapters on treatment follow which are much too brief to be a guide to a practitioner. He apparently does not feel that a psychotherapist necessarily need be medically trained if he practice in conjunction with a qualified medical practitioner. He states that the best training for a would be psychotherapist, in lieu of undergoing a course of personal treatment, can be obtained through a well conducted children's clinic where the necessity for secrecy is not so great. The final chapter has an interesting presentation of the integration of the personality. There is an adequate index and a good bibliography.

While attractively written and useful as a presentation of a psychiatric point of view to the uninformed, it is doubtful if this book supplies any need not filled by the standard texts.

HENRY W. BROSON, M. D.,
Colorado Psychopathic Hospital.

FOR STUTTERERS. By *Smiley Blanton, M. D., and Margaret Gray Blanton.* (New York, D. Appleton-Century Company, Inc., 1936.)

This small book of 191 pages is addressed primarily to the stutterer himself in order that his appreciation of his problem may help in its solution. Beyond this, the book is obviously of value to the family and friends of the stutterer and those attempting to help him on a professional basis. The concept on which the presentation is based is that stuttering is just one facet of the expressed personality, and that as such it must portray and be determined by that which lies beneath. It is obvious that the authors are bound by this thesis to deal with the underlying determinants in a non-specific law. It is, after all, the same personality that underlies the stutterer's manner of walking, his relation to his acquaintances, and all other personal characteristics. It may be somewhat difficult for the lay reader to digest this non-specific approach when traditional treatment has been orally centered. The authors do not

clarify the differentiating features that produce a disorder of speech rather than some other disorder. They stress the point that the non-specific elements are so mighty and so fundamental that they deserve primary attention.

The book was given by the reviewer to an intelligent non-stuttering adolescent for comment. Discussion showed that, in general, the main thesis was well grasped. The details of psychopathology were fairly understood, but the neurological presentation resulted in no clear picture and tended to result in some confusion.

Even though some of the neurological and psychopathological discussion is not readily absorbed, it does leave the correct impression that the subject is a very complex one. It might here be emphasized that the didactic and clinical training required for winning the degree Doctor of Medicine in no sense equips the physician to deal with the stutterer, and that even the ordinary course of preparation for psychiatry does little better.

GEORGE S. STEVENSON, M. D.

THIRD ANNUAL REPORT OF MENTAL INSTITUTIONS. Dominion of Canada.
(Ottawa: Dominion Bureau of Statistics, 1934.)

This report represents a summary of the significant data concerning mental institutions in Canada for the year 1934, along with some comparative data for each of the three years (1931 to 1934) for which a similar report has been made.

"The report is presented in two sections. Part I deals with administrative aspects, general statistics of movement of patient population and statement of finances in all mental institutions in Canada. Part II includes special and detailed information in the form of tables covering first admissions, readmissions, discharges, transfers and deaths in 31 public hospitals, together with detailed classifications of the various psychoses of patients and a large body of other important data made available by the card system which is now in use in 31 public mental hospitals in Canada."

There were 58 institutions in Canada at the close of the year 1934, 36 of which were public hospitals under the control of provincial governments, the others being county, municipal, Dominion or privately controlled institutions. Of the 58 institutions in Canada, Prince Edward Island and New Brunswick each had one, Saskatchewan had two, Alberta and Manitoba each had four, British Columbia had five, Quebec had nine, and Nova Scotia and Ontario each had sixteen. The large number of institutions listed for Nova Scotia is due to the fact that this province still maintains fourteen county institutions along with its one provincial hospital and one provincial training school, thus differing from the other provinces, where there are no county institutions. Ontario, which has the same total number of institutions as Nova Scotia, maintains ten provincial hospitals. The total patient population at the close of the year 1934 was 39,106, which was, incidentally, about 400 more than the normal capacity. The daily average resident patients for the year was 36,571, of which 79.72 per cent were classified as insane, 18.91 per cent feeble-minded, and 1.37 per cent epileptic. The total personnel for institutions in Canada

was 6915 employees. For 39 institutions solely given to the care of mental patients, there was one physician to every 156.1 patients and one graduate nurse to each 40.5 patients.

There is clearly tabulated information concerning the admissions, discharges and deaths for patients for the year 1934, and also comparative mortality rates for the years 1930 to 1934. The proportion of admissions per 100,000 of population was 73.1 and the readmissions 17.6, making a total of 90.7 for direct admissions. There were 5511 patients discharged from institutions in 1934 which was 11.5 per cent of the total patients treated. The deaths numbered 2253 which was 4.7 per cent of the total patients treated, which is at the rate of 62.1 per 1000 patients in mental institutions. For 1931 this was 64.2, for 1932, 68.0, and for 1933, 62.1.

Tables concerning finances indicate that: receipts for maintenance of institutions are made up for the most part of provincial grants, amounting to about 61.8 per cent of the total receipts, federal payments which are less than 5.8 per cent, municipal grants which are about 6.0 per cent, and receipts from paying patients which are 13.7 per cent of the total receipts. The average yearly expenditure per patient is \$354.96 or 97c per day for total expenditures.

Of first admissions, 79.7 per cent are classed as insane, the remainder including mental defectives, epileptics, alcoholics, drug addicts, etc. The psychoses of first admissions show that with 23.1 per cent in the dementia præcox group and 13.1 per cent in the manic depressive group, these two are the largest groups. For readmissions, 31.8 per cent belonged to the manic depressive group and 25.9 per cent were cases of dementia præcox. 27.3 per cent of all patients were discharged as recovered, 51.2 per cent as improved. 17.2 per cent as unimproved, and 4.3 per cent as without psychosis. The rate of recovery is 23.9 per cent for males and 31.5 per cent for females. The largest number of deaths occurred in the dementia præcox group with 19.5 per cent, manic depressive with 8.7 per cent, senile with 19.2 per cent, and general paresis with 7.1 per cent.

It is interesting to note the comparative figures both for the year 1934 itself and for the years 1931 to 1934. There was an increase of 1668 patients for the year 1934, the provinces of Quebec and New Brunswick showing the largest increase. The number of patients per 100,000 of the mean population increased from 324.9 at the end of 1933 to 335.6 at the end of 1934. For the period 1931 to 1934, whereas the normal capacity was increased by 3,034, the daily average residence was increased by 4885. The figures showing the number of patients per 100,000 of general population indicate that this is not due to an increase in population, with 305.4 patients per 100,000 of general population in 1931, and 335.6 patients per 100,000 of general population in 1934." This serious problem is being met by increasing the bed accommodation in mental institutions, by a larger use of the parole system, by boarding-out of selected patients, by the reestablishment of improved or recovered patients, by improvement in stages by the various mental health clinics."

MIRIAM M. WINSTON, M. A.,
Toronto.

WORKBOOK IN PSYCHOLOGY. By *Carl Havelock Wedell*. (New York: John Wiley and Sons. London: Chapman & Hall, Ltd., 1936.)

This is a student's workbook to accompany *Psychology, —A Factual Textbook*, edited by Boring, Langfeld and Weld. It divides the material into thirty-three lessons, each of which includes suggestions for study, notes and explanations, exercises and questions to be answered by the student. It reflects the "factual" emphasis of the text, and draws attention to the more difficult concepts employed. Like other tools, its value will depend on the manner of its use. Of its kind, it is a very carefully constructed manual.

W. LINE.

THE SOCIAL WORKER IN THE PREVENTION AND TREATMENT OF DELINQUENCY. By *Margaretta Williamson*. (New York: Columbia University Press, 1935.)

This volume is the fourth in a Job Analysis Series prepared under the auspices of the American Association of Social Workers. It presents a discussion of the everyday functions of probation, parole, and protective agency officers, and of their supervisors and executives. The discussion is quite detailed and covers a wide range of topics, such as the part of the chief executive officer in the determination of policy, the personnel requirements of field workers, suggestions as to forms of case records and reports, and the use of the bulletin board. The author does not attempt to lay down standards nor to estimate the value of existing practices, but examples are quoted of the practices in many agencies. The information has been gleaned from many sources and has been reviewed by a committee of specialists in these fields. The material is presented in a systematic manner and will undoubtedly be found interesting and suggestive by workers in these agencies.

The title of the book is somewhat misleading in view of the limitation of material to the fields of the probation, parole, and the protective agencies. There is no discussion of the functions of the social worker in institutions for the delinquent—it is explained in the foreword that this is omitted for reasons of space and cost. Under this title one might expect a discussion of the part of the social worker in family and psychiatric social work, in view of the generally recognized necessity, in the prevention of delinquency, of reaching the individual in the pre-delinquent stage. This phase of the field has been covered, it is said, in the preceding volumes of this series.

The statement that "recent trends in case work attach increasing significance to the boy's or girl's own story, and to psychological rather than sociological or environmental factors" is one of many statements that will be of particular interest to the psychiatric reader. A change in the viewpoint of protective agencies from that implied in the aim of "strengthening the moral fibre" of their clients to that of "study of community situations unfavourable to wholesome development of young persons" is an indication of some progress towards practical objectives. The psychiatrist will also be interested in the all too brief description of the field worker's attempts to work directly upon the personality of the offender. The principal objection

that this reviewer would make to this volume, within the field of prevention and treatment that it sets out to describe, is the inadequacy with which the personal relationships of worker and offender are discussed. Much space is devoted to the "mechanics" of the officer's functions, such as size of case load, frequency and place of offender's reporting to the worker, hours of work, and to environmental aspects of investigation and treatment, such as persons to be interviewed regarding the offender's previous behavior and changes of school placement. The personal relations existing between the worker and the delinquent individual are surely the nub of the situation so far as the worker's effectiveness in the prevention and treatment of delinquency is concerned. It seems woefully inadequate to say in this connection, in the chapter on the probation officer, only that "here and there a particular officer has tried to direct his relationships with the probationer so as to encourage growth of character and the development of judgment, initiative, self-respect and ability to make decisions," with one short paragraph of explanation.

C. G. STOGDILL, M. D.,
Toronto.

HUMAN PERSONALITY AND THE ENVIRONMENT. By *Charles Macfie Campbell, M. D.* (New York: The Macmillan Company, 1934.)

This book presents the substance of six lectures delivered before a lay audience at the Lowell Institute, Boston, February 1933.

Dr. Campbell says, "Our present use of the term personality lays less emphasis on appearance than on reality; the personality is the expression of the total forces of the individual, it is the product of their integrated activity, it is the man in action as seen by the outsider and known to himself." This idea of integration and of total forces of the individual is not lost sight of throughout the book. Even the "basic supplies" in chapter I, food, water, air, sunshine are not isolated things in relation to the individual.

Chapter II deals with bodily equipment. There is a nice mingling of precise data regarding the central nervous system, the autonomic nervous system, the endocrine glands and of assumptions and theoretical considerations about human behavior.

"From Cell to Person" gives some glimpses of genetics, but more particularly shows the importance of habits formed in infancy and childhood, of the likes and dislikes of this period and their effects upon adult personality.

Having considered in the first three chapters "some general factors involved in the human personality," the author proceeds in the last three to a "summary review of some particular qualities and to scrutinize the divergences in human personality which make each individual unique and give to social intercourse much of its colour and charm."

The discussion in chapter IV of how individuals differ, reviews the efforts of various men to classify personality types, and illustrates from the lives of famous personalities. Dr. Campbell says that "it is well to emphasize the fact that each detail of the behaviour of the individual is but one aspect of the adaptation to its environment of a unitary organism which in its earliest

and simplest stage was a fertilized ovum, a single cell. Structures and functions have developed, adaptations of great complexity have been elaborated which throw the chief stress of function now here, now there, but each phenomenon of the personality on which we concentrate our attention is but one aspect of the maintenance by the organism of its internal dynamic equilibrium and of its adaptation to the total situation."

Again in chapter V are many notable individual examples of how "the tasks of life" were done by Captain Scott, Rukeyser, Helen Keller, Lord Byron, Karolyi, Schopenhauer and others. The importance of physical handicaps, the urge of sex, the influence of repression are noted in individual adaptations.

The final chapter discusses the personality and the total situation with again illustrative material.

We have found the book stimulating, challenging and exceedingly well written, and as the lectures were originally for laymen we have pleasure in giving, with his permission, the opinion of a distinguished Toronto layman about this book—"A book such as Dr. Campbell's 'Human Personality and the Environment' is a valuable acquisition and deserves a wide public. It appeals to the general reader on the practical side, that is on the side he can most readily appreciate. Even if the arguments are directed to things outside the reader's own personal experience, they refer to experiences which his common sense at once accepts as reasonable, and the whole approach to the subject is one which will catch up his interest and sympathy.

"He knows that he is more irritable when he is weary, and cold and hungry. He can therefore understand that the rarefaction of atmosphere at considerable heights above the ground can change a man's outward temperament, or that intense cold and hunger, backed by the protracted insufficient nourishment, can bring changes in a man's personality. This is a cleverly planned introduction for the general reader and followed as it is by a consideration of the mental states produced by a temporary or permanent change in the glandular balance of the body, the subject may for many a general reader become really intelligible for the first time. Moreover, the shrewd observations in life itself which Dr. Campbell drops from time to time, often in the form of clever aphorisms, obviously come from a wide experience and mature judgment. They form a welcome contrast to the Pitkinish and similar pseudo-life-philosophy of the present day.

"The book takes on an increased value when we realize how near we may be to biological discoveries which may be of the highest significance in the psychological world. All the work now going on in the field of the ductless glands, which as Julian Huxley says 'control not only the chemistry of our bodies, but influence the activities of our souls,' may open up solutions to problems which are at the moment unsolved. This may happen to-morrow, or next week, or next month, or next year. Any reader who goes carefully through Dr. Campbell's book (and all who begin it will be carried through it by sheer interest) will be prepared for the next step which psychiatry is preparing to take."

E. P. LEWIS,
Toronto.

THE NERVOUS PATIENT. By *Charles Phillips Emerson, M. D.* (Philadelphia: J. B. Lippincott Co., 1935.)

Full blooded specialists of system diseases will probably be irritated by this book, not because they cannot understand it but because they will not. However, they should study it. Nothing spoils an otherwise "good" case for a specialist than the complication of nervous and mental symptoms in the patient. In the preface Professor Emerson states that this book is for general practitioners, not for specialists. He does this, evidently knowing that the practitioners will understand it and that the specialists won't. Heaven help us if we were to take for granted that specialists can never be expected to understand human nature! We really must keep on trying. Professor Emerson's effort is a good one. But while the specialists should study this book in order to bring their specialty into proper perspective with the rest of the individual yet the general practitioner will find the greatest help in crystalizing many impressions which have been merely vague shapes. Here he will find clarification of innumerable cases, very common, in which he has been unable to do more than a good deal of uncomfortable blundering, but because of his faithfulness, has seen the thing through and often with success. Professor Emerson has approached the subject of ill health as it should be approached—that a patient is not only the subject of a local disease but that through his autonomic nervous system, which includes a good deal of the mind, all other systems are upset and adjust more or less successfully—that this process of adjustment may produce symptoms far more disturbing to the patient than the local lesion—that both must be understood and treated—that as time goes on the importance of the original local lesion grows less and less and that no amount of treatment for it, surgical or medical, will cure that patient. Professor Emerson has laid his plan skilfully, it would be easy to be confusing—but he is never confusing. The system diseases are discussed in turn and the possibilities and common functional nervous symptoms which may be a complication or a part of the clinical picture are set in their proper perspective.

The minor and major psychotic states are well described and most readable. Exception could be taken to a few statements. One could not agree, for instance, that arterial hypotension is caused by adrenal insufficiency and that it explains more psychoneurotic symptoms than does hypertension.

TREVOR OWEN, M. D.

GROWING SUPERIOR CHILDREN. By *I. Newton Kugelmass.* (New York: D. Appleton-Century Co., 1935.)

Doctor Kugelmass' new book "Growing Superior Children" provides the modern parent, nurse, or teacher with a comprehensive text of the development and care of the present day child. The subject is treated by a division into four sections, namely: Our Newborns, Our Infants, Our Children and Our Adolescents.

The first section deals with conception and the rudiments of embryology. The many old ideas associated with pregnancy and its influence upon the

fœtus are shown to be without foundation. Heredity is said to be 80 per cent important in forming the personality, characteristics and capacities of the newborn individual. Detailed instructions are contained in this part for the feeding of the newborn during his first few days of life.

The second part of the book is devoted to the infant. The normal growth both mental and physical is outlined and the common departures from normal are mentioned. Artificial feeding is discussed at some length and relatively little space is given to the nursing infant. An interesting chapter deals with the mental processes of the infant and his first reactions. The importance of early habit training is duly emphasized and the reader will find many practical suggestions regarding the initiation of proper hygienic habits. A splendid chapter in this section of the book deals with the prevention of childhood disorders in infancy and discusses not only the common physical ailments but masturbation, temper tantrums, and breath holding as well.

The section concerning "Our Children" considers the child as an individual unlike his fellows in almost every respect. The author deplores the present day tendency toward the "average child" and he emphasizes the child's own individuality. The reader will find a simple but reliable course in dietetics and the importance food plays in growth, development, and the prevention of illness. The problems of enuresis, terrors, jealousy, seclusiveness and the awakening of sex are comprehensively handled and discussed in a non-technical manner. This whole section attempts to give advice relative to developing the individual child to the maximum of his inherent characteristics rather than molding him to the "average."

The final section of the book deals with the problems of adolescence. The signs and symptoms of puberty and their attendant problems are discussed. A large part of this section deals with the emotional upsets and their psychological background that are so frequently seen in the present day. Very constructive information is given regarding social behavior in adolescence.

The book is written in a pleasing style, is beautifully illustrated by many photographs, and is as free as possible from technical terms and intricate explanations. The volume is a valuable asset to the parent, teacher, social worker or psychologist, and is a real contribution to the mental and physical health of future generations.

GARNET P. HAMBLIN, M. D.,
Dept. of Pediatrics, University of Toronto.

NEW PATHWAYS FOR CHILDREN WITH CEREBRAL PALSY. By *Gladys Gage Rogers*, and *Leah C. Thomas*. (New York: Macmillan Co., 1935.)

All those responsible in any way for the physical and mental welfare of a child suffering from cerebral paralysis should read "New Pathways for Children with Cerebral Palsy," by Gladys Gage Rogers and Leah C. Thomas. The book contains much valuable information and a complete list of references but its special quality is the emphasis it lays upon what is undoubtedly by far the most important factor in the care of children suffering from this disability, namely, the profound influence that their physical condition has upon their mental development.

As yet it is not as widely recognized as would be desirable that children suffering from cerebral paralysis appear to be mentally retarded because of their lack of the normal ideomotor stimuli and their consequent need of the full development of other stimuli. The authors give this aspect of the situation the prominence it deserves and describe in ample detail the methods that have been followed so successfully at Robin Hood's Barn by which the compensatory stimuli are provided. They also stress the fact that nothing is more essential to those upon whom the care of these patients devolves than an unremitting patience. The injury done them by injudicious reference to their incapacities and by placing them in those situations which force their incapacities upon their attention is also dealt with in a detailed and graphic manner. The authors' own experience has completely convinced them of the value of encouragement and the great advantages that are gained by devising forms of play which provide the necessary muscle training.

With its descriptions of appropriate games and its lists of toys and of furniture suitable to the sufferers from these disabilities, and above all by the wholesome, sane and courageous atmosphere that pervades its every page, the book is one which may be recommended to the parents and teachers of every child suffering from spastic paralysis.

J. L. BIGGAR, M. D.

THE 1935 YEAR BOOK OF NEUROLOGY, PSYCHIATRY AND ENDOCRINOLOGY.

Edited by *Hans H. Reese, M. D., Harry A. Paskind, M. D., and Elmer L. Sevringhaus, M. D.* (Chicago: The Year Book Publishers, 1936.)

This valuable review is under the same editorship as last year and follows the same plan of arrangement. Each of the three sections is preceded by a brief introduction by the editor of that section, in which attention is directed to the outstanding developments of the year.

Dr. Reese, introducing the section on neurology, indicates three leading directions of research during the past year, in which the anatomists and physiologists, the neuropathologists and clinicians have collaborated. These are studies relating to the diencephalon, the premotor area and the electric potential graphs of the brain.

"The extremely complicated complex of cell groups, of fiber tracts, and of intersynaptic relation [in the diencephalon] has become disentangled from an anatomic point of view, at least. Biochemic and experimental accumulation of data are slowly crystallizing into suggestive clinical syndromes revealing the special function of its nuclei and tracts."

Experimental work on motor function has demonstrated the importance of the premotor area as well as the motor area and made possible a more definite localization of upper motor neuron and cortical lesions.

Electro-encephalographic studies seem to have established specific wave patterns for various cortical areas with suggestive alterations responsive to emotional disturbances or mental activity. The hopes of workers in this field recall those of the histopathologists of thirty years or more ago.

The editor points out that the literature relating to heredity, eugenics and psychoanalysis has not been reviewed, "partly because of limited space and

partly because of the extreme divergence of opinion." It seems unfortunate that so fundamental a matter as heredity could not have found representation.

Introducing the section on psychiatry Dr. Paskind observes that "although not a single perplexing problem is solved the literature abounds with valuable and interesting contributions." There has been much activity in the field of experimental therapeutics, for example, induced convulsions in the treatment of schizophrenia and atropine and ergotamine in manic-depressive psychosis. Hematoporphyrin treatment in depression does not appear to have confirmed the early hopes for it. The fever therapy of paresis has been actively prosecuted and with continuing good reports, "but there is general recognition that this method does not represent the last word in the treatment of paresis, and the search for new methods is continuing."

"Orthopsychiatry and social psychiatry have grown rapidly, but, it must be regretted, not always soundly and under proper critical guidance." The editor points appropriately to the tendency still prevailing in some quarters to "oversell" psychiatry, and to stress over-optimistically the possibilities of prevention. "Environmental influences have been overemphasized and insufficient attention paid to constitutional factors."

"This year's literature also contains a timely and valid plea for the medical (as contrasted with the social, psychologic, and psychoanalytic) approach to behavior disorders of children. It is well within the bounds of possibility that child guidance problems have wandered too far from the domain of medicine, and it is encouraging to see that this trend is being resisted."

Dr. Sevringhaus, who gave an excellent epitome of systematic endocrinology as an introduction to this new section in the Year Book of 1934, presents in the present edition such changes in viewpoint or new discoveries as have appeared within the year. The clinical signs and therapeutic indications approved to date in the various endocrine disturbances are clearly and concisely set forth.

The book contains numerous graphs, charts, diagrams and photographic illustrations, and is provided with a good subject index and an author index.

C. B. F.

In Memoriam.

DR. CHARLES LOOMIS DANA.

1852-1935.

The following memorial of Dr. Dana was prepared by Dr. Frederick Peterson for the Bulletin of the New York Academy of Medicine, and appeared in the January, 1936, issue of that publication. Dr. Peterson and the New York Academy of Medicine have kindly permitted the JOURNAL to reprint the memorial.

Dr. Charles Loomis Dana was born in Woodstock, Vermont, March 25, 1852, and died in Harmon, New York, Dec. 12, 1935, in his eighty-third year. He was of that fine New England stock that numbered among his ancestors two Governors of the Massachusetts Bay Colony (Simon Bradstreet and Thomas Dudley) and the Rev. Seaborn Cotton, and among his cousins near or distant, men like Charles Stanhope Cotton, William Everett, Francis Lee Higginson, Oliver Wendell Holmes, Robert Treat Paine and Charles Sprague Sargent, to mention only a few of the determinants in his élan and career.

He was graduated in 1872 with a B. A. degree from Dartmouth not far from his home town and then became secretary to Senator Morrill of Vermont for three years during which he lived in Washington, D. C. While secretary to the Senator he was attracted to the study of medicine, entering the National Medical College there in 1874, and graduated as M. D. in 1876. In 1875 he became for a year private secretary to Professor Spencer F. Baird, head of the Smithsonian Institute, but resigned in the autumn of 1876 to enter the College of Physicians and Surgeons, New York, from which he obtained his medical degree in the spring of 1877. Then he had two years in Bellevue Hospital under the great Flint and inspiring Janeway. After this he opened an office in West 46th Street and combined some general practice with a year or two of work in the Marine Hospital Service. About this time he made contacts with Drs. Seguin, Hammond and Beard who were practically the only neurologists of that period in New York, and Beard turned over

to him his summer practice for two seasons. This was the beginning of his devotion to the special field of neurology which occupied the rest of his life. He became an active member of the New York Neurological Society and the American Neurological Association, and in the course of time was made President of each of these organizations. He wrote many papers on nervous disorders and finally a standard textbook on nervous and mental diseases. From 1902 onward he was Professor of Nervous Diseases in the Cornell University Medical College in New York. His Alma Mater Dartmouth gave him the degree of LL. D. in 1905 and the same degree was given him at the University of Edinburgh in 1927.

In October, 1886, he was elected a Fellow of the Academy of Medicine of New York and became its President for the years 1905 and 1906. But aside from the brief period in which he was President of the Academy (two years), he always took an active part in its work and proceedings, especially as a trustee (1906-1934) and in connection with its important Public Health Relations Committee of which he was the indefatigable Chairman for seventeen years (1911-1928). In one of his reports as chairman he described the activities of the Public Health Relations Committee (consisting of thirty members representing all branches of medicine): The matters studied by this Committee included the organization, standards, needs of hospitals and dispensaries, care of the defective and delinquent in children's courts, institutions, etc., uniform federal quarantine, improvement of living and working conditions in the city, protection of the health and nutrition of children, special studies of epidemics, instruction to the laity and those engaged in public health work, and many other activities that have brought the Committee into contact with every variety of health, educational, social and municipal problems.

About 1922 this Committee at the instigation of Dr. Dana and Dr. Salmon appointed a sub-committee on Religion and Medicine which made surveys of religious healing throughout America and Europe with a special study of Lourdes, and compiled a bibliography of psychosomatic relations published by the Columbia University Press. The scope of this sub-committee has recently been increased by including together with religious healing many other fields in which the mind has to do with health, such as mental contagions (panics, effects of moving pictures, radio, newspaper

accounts of crimes, etc.), psychotherapy, psychoanalysis in unskilled hands, faith cure, Christian Science, and the like. Dr. Dana would have welcomed this expansion into a Committee on Emotions and Health, for he was very much alive to the changing conditions in the world, and to the analogies between the body physiologic and the body politic.

In his early days of practice the "rest cure" was current therapy, but Dr. Dana with others in the same field came to the conclusion that the best rest for anyone is to do something different. It was this idea that led to his becoming one of the founders of the Charaka Club, the members of which are physicians with various hobbies, such as general literature, painting, sculpture, etching and the like. Among early members were S. Weir Mitchell, Sir William Osler, John S. Billings, B. Sachs, Pearce Bailey, Joseph Collins, Walter James. In the seven volumes of transactions of the Charaka Club are various contributions by Dr. Dana, as for instance *The Medicine of Horace*, *the Cult of Aesculapius*, *When Apollo strikes the Lyre*, *the Costume of the Ancient Greek Physician*, and a very fine *Sonnet to Clio*. Few would have suspected him of a lyric urge, although his lifelong devotion to Horace must have augured at least some danger of contagion.

Dr. Dana had a keen provocative mind. He was an excellent teacher and his pupils admired and esteemed him. Dr. Kennedy of his staff at Bellevue and Cornell bore witness to this at a testimonial dinner to Dr. Dana at the University Club in 1926 when he said: "His work there, the devotion which his personality naturally commanded from the young men who eagerly surrounded him, his vision and his power for organization have resulted today in a strong department in Cornell and a unique neurological unit in Bellevue Hospital, where medicine and the poor are both well served under his ægis."

Under a serious and occasionally somewhat austere manner, he hid a warm and generous heart, eager to do his best for the individual and for the cause of humanity. He had too a delightful sense of humor as evidenced by his "Complete Guide to Togo Hill." Dr. Dana was a collector of many things, paintings, prints, books, ceramics, textiles, etc., and Togo Hill which was the name of his summer place at Woodstock, Vermont, was a depository for some

of his treasures. Many visitors came to see him in this sanctuary, so a guidebook seemed necessary. Here are a few quotations:

"Painstaking visitors, who should have rubber-soled shoes and a good sense of equilibrium, having driven to the foot of the Hill will take the Cardiopathic Way. Passing a small Buddhavista of the Ming period they rise one foot in ten until they reach the Bungalow and are confronted with Togo, the 500-year-old marble Dog who keeps off the evil spirits by the enchantments of his face. They will note the carved figure of St. Francis of Assisi in the Oaken Shrine; also the Greek theatre."

"They will walk over the Greek Bridge—the only one in America—designed by an expert in ancient arts from the Metropolitan Museum and constructed by two of Woodstock's favorite sons."

"Below the Pailou are the enamelled iron statues of two Chinese scholars, which formerly stood near a Temple of Confucius in Thibet four hundred years ago. The dogs are genuine Ming (A. D. 1400). The marble headposts came from the fence that surrounds the Summer Palace of the Empress of China. The outlook is pure Vermont, but the yellow umbrella is from Coney Island."

And so Dr. Dana was a pure embodiment of all that is best in New England character, straight and direct in thought, quiet and reserved in manner, equal to any emergency, human and compassionate in all his dealings, but with a fund of quiet humor that made him the most genial of friends and companions.

SYLVESTER R. LEAHY.

1882-1936.

Dr. Sylvester R. Leahy was born in New Haven, Conn., on August 12, 1882. He was educated at the Bacon Academy and Hillhouse High School in New Haven. He received his medical degree from Yale University School of Medicine in 1905. He had a one year substitute internship at Bellevue Hospital, six months at the Willard Parker Hospital, and 18 months at the Christ Hospital in Jersey City. Very early in his medical career he evinced an interest in psychiatry. On August 8, 1909, he was appointed medical interne at the Kings Park State Hospital, and he was promoted from various grades until he became senior physician at the institution. In January 1913, he was transferred from Kings Park State Hospi-

tal to the Manhattan State Hospital where he remained as a senior physician until September, 1914. He then assumed the position of resident alienist in charge of the psychiatric division at Kings County Hospital. In August 1918, he entered active service in the U. S. Army and was assigned to the Port of Embarkation in New York City. From there he was transferred to Ward 55 of General Hospital No. 1, where he later became the commanding officer. Following his discharge from military service in September 1919, he became assistant alienist in Bellevue Psychiatric Division and he remained there until 1922. He entered private practice in 1920, and in 1922 he received an appointment as police surgeon to the Police Department. He was director of the Mental Clinic of St. Vincent's Hospital from March 1922 to June 1931. In 1926 he became assistant attending neurologist at the New York Neurological Institute, a position which he held until his death. He was instructor in psychiatry at New York University Medical School from 1920 to 1922 and clinical professor of psychiatry from 1922 to 1929. He was associate in psychiatry in Columbia University since 1931.

Dr. Leahy was a student, and he constantly sought information and knowledge in his particular field of interest. He received his B. A. degree from Fordham University in 1922 and his M. A. degree from the same university in 1923. He realized the need of neurological experience even in psychiatric work. He therefore attached himself to the New York Neurological Institute. Appreciating the value of the newer concepts of mental mechanisms, he underwent a didactic analysis in 1932, and was an enrolled student in the many courses given at the New York Psychoanalytic Institute. In the later years of his life he was an active worker in the field of psychoanalysis. He took great interest in all scientific organizations dealing with neuropsychiatry. He was a member of the New York Academy of Medicine, The American Psychiatric Association and the New York Neurological Society. He was one of the organizers, and secretary of the New York Society for Clinical Psychiatry.

Dr. Leahy was a very energetic and arduous worker. He was liked by both his colleagues and his patients. He was ever ready to give a helping hand to those who needed it. He was very tactful and diplomatic in his relationship with people, but always honest and honorable in his dealing with everybody. In the state hospitals,

in the psychiatric wards at Kings County and Bellevue Hospitals, as well as in the other hospitals with which he was affiliated, he always did his work thoroughly and well. He never shirked and very often did the work which others should have done. He belonged to the great number of men who work diligently and faithfully but for whose work others receive credit. He was genuinely cheerful and optimistic, and his presence radiated cheer and happiness wherever he went. He was a true and devoted friend, and he always respected the right and privileges of those with whom he came into contact. He was a pioneer in the field of extramural psychiatry. His advice was sought by many lawyers in medico-legal cases. That he was always honorable both to his profession as well as to those whom he served, is well illustrated in his position as expert in the Gray-Snyder case. Upon his insistence there was a joint examination and a unanimous report of the experts for the defense as well as for prosecution. This was really a milestone in medico-legal testimony.

Of a cheerful and enthusiastic nature, of a hard working disposition, always kind and ever ready to help others, always minding his own business, speaking kindly even of those who deserved other comment, ever ready to study and acquaint himself with newer knowledge in his profession, a kind and gentle man, Dr. Leahy occupied a unique position in neuropsychiatry. His memory will remain green with those who were privileged to work with him.

IRVING J. SANDS.

HUGH ALEXANDER McKAY.

1884-1936.

Dr. Hugh Alexander McKay, superintendent of the Ontario Hospital, New Toronto, died of septicæmia on February 14, 1936, in the Private Patients' Pavilion of the Toronto General Hospital. While he had not enjoyed the best of health since October 1935, his untimely death resulted from an acute illness of a few days' duration.

Born on July 19, 1884, near Southampton, Ontario, in Bruce County where his father still lives, Dr. McKay was of Scottish parentage. His early education began in the local public schools and was continued in the Collegiate Institute at Owen Sound. After

a couple of years in the banking offices of the Canadian Bank of Commerce at Saskatoon and Toronto, he entered the University of Toronto in 1908 in the Faculty of Medicine in the then newly established five year course. While illness delayed his graduation for a year, he gained excellent and varied experience through internship in the Wellesley Hospital, the Hospital for Sick Children, the Isolation Hospital and in the Toronto General Hospital on the surgical service of Dr. H. A. Bruce, the present Lieutenant-Governor of Ontario. One summer he spent at the Manhattan Lying-in Hospital in New York. Dr. McKay obtained his degree in medicine in June 1914, and at once entered the field of psychiatry, as assistant physician at the Ontario Hospital, Toronto, under Dr. James Forster. During 1914-15 he attended a short course at Dr. William Healy's clinic in Chicago, and in July 1915, he was transferred to the Ontario Reformatory at Guelph as physician and psychiatrist in charge of some one hundred criminally insane. July 1916, brought another transfer, this time to the Military Hospital at Cobourg which in November of that year came under the Canadian Army Medical Corps and the Military Hospitals Commission of Canada. It was really a newly established clearing centre for war neuroses in the Canadian Army. Dr. McKay was appointed officer commanding Cobourg Military Hospital in September 1917, and he was for several months 2d acting D. A. D. M. S. for military district No. 3, Kingston. From May 1918 to February 1920, his military service took him to England where he registered with the College of Physicians and Surgeons. He returned to Canada in February 1920, and at once organized and took charge of the neuropsychiatric service of the St. Anne de Bellevue Hospital in Quebec. This was one of two Dominion hospitals for treatment of neuropsychiatric war disabilities under the Department of Soldiers' Civil Re-establishment, and it served Quebec and the Maritime provinces. In January 1921, Dr. McKay was transferred to Hamilton as assistant superintendent of the Ontario Hospital, and he remained there seven years. In March 1928, he was appointed superintendent of the Ontario Hospital, Toronto, and he was transferred on January 1, 1930, to New Toronto, as superintendent of the Ontario Hospital at that place. His previous experience stood him in good stead for the exacting duties associated with the reorganization and extensive rebuilding program there in progress, and his contribution can scarcely be overestimated.

Dr. McKay was actively interested in The American Psychiatric Association, and he attended its meetings whenever possible. When that body met in Toronto in 1931 he was chairman of the Committee on Arrangements. As a member of its present Committee on Hospitals he attended the meeting in New York in December 1935. He was vice-president of the Ontario Neuro-psychiatric Association for the current year, was a member of the Nu Sigma Nu medical fraternity, vice-president of the New Toronto Rotary Club, and a Scottish Rite Mason. In religion he was a Presbyterian.

Dr. McKay is survived by his widow, Ruby Peterkin McKay, whom he married in 1918.

He was a man of sterling character. He was quiet in manner, cautious, always considerate of others, of sound judgment, possessing a delightful sense of humor, and a staunch and loyal friend. His concern for his patients, and for his staff in general, never allowed him to spare himself any effort for their well-being, and his fairness in dealing with them was markedly characteristic of him. It was a great shock to the staff of his hospital, to patients and their relatives, to the Ontario Department of Health, and to his hosts of friends both in psychiatry and elsewhere, that this outstanding man, one of the senior psychiatrists of the Ontario service, should be so suddenly taken. He was one of nature's noblemen, whose passing creates a most regrettable loss.

E. P. LEWIS.